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THE NEW ENGLAND BOTANICAL CLUB

Vol. 7 November, 1905 No. 83

THE USE OF ACCENTUAL MARKS IN GRAY'S MANUAL.

EZRA BRAINERD.

I CANNOT refrain from expressing my amazement at a portion of Mr. Pease's article in the September RHODORA. I concur in what he says regarding the proper syllable to receive the accent, and am ready to try to say HYPERĪ CUM and POLYGŎN′ ATUM. But on page 160, paragraph marked "2," he passes outside of the subject indicated by his title, to speak of "vowel quantities," and criticises in the Gray Manual the use of certain accentual marks that have stood unchallenged for nearly fifty years.

Surely in the instances cited, with the two exceptions of PÍCEA and SAPÍNDUS, accepted as genera only in the last edition,[1] these marks are correctly used in the Manual. The proposed changes are in direct violation of long established and well known rules for the English pronunciation of Latin, and would lead us into ridiculous pedantry.

Mr. Pease evidently confuses two very different things, *viz.*: (1) the *ancient* distinction of vowels as "long" or "short" — referring not so much to quality of sound as to *length of time in uttering* the sound; and (2) the *English* distinction of vowels as "long" or "short" — referring to change of *quality*, according, for the most part, as a vowel ends a syllable or is followed by a consonant in the same syllable. Mr. Pease's erudition has enabled him to point out

[1] Dr. Gray himself in the Garden Botany, 1870, pp. 70 & 312 gives these words the correct accentual marks. "*Aegopódum*" in Mr. Pease's list is plainly a misprint for *Aegopodium*.

in the accented syllable of seventy-one generic names the vowel quantity as used in ancient prosody; but this has no bearing whatever upon the English method of pronouncing any of the names in his long list. Dr. Gray (and Dr. Watson and Dr. Britton after him) used the grave accent ` to indicate, not Latin quantity, but that the vowel over which it stood was to have the so-called long English sound; and the acute accent ´ to indicate, not that the vowel was short in Latin prosody, but was to have the "short-vowel" sound when pronounced by the English method.

It is hard to believe that Mr. Pease would have us pronounce RHUS as though spelled RŪSE, or RÒSA as though spelled RŎS'SA, and THÝMUS as though spelled Thў̆m'mus, ÀCER as though ĂS'SER, CLÉMATIS as CLĒ-MATIS, LÍLIUM as LĪ-LIUM. He admits that the English method of pronouncing Latin is "so firmly established in this country for scientific names that nothing short of a revolution in pronunciation could supplant it." But such changes as those just cited are contrary to the first principles of the English method, and decidedly revolutionary; at the same time they are equally far from what is commonly supposed to have been the pronunciation of the ancient Romans.

We have an excellent statement of the rules for pronouncing Latin by the English method in Harkness' Latin Grammar; and the subject is well discussed in most pronouncing dictionaries of Greek and Roman proper names. A few hours' study of these rules would enable our botanists to pronounce names of plants uniformly and consistently. What we hear now is frequently, not the Roman method nor the "continental method," but a medley of these with the English method.

MIDDLEBURY COLLEGE, Middlebury, Vermont.

AN ALPINE ADIANTUM.

M. L. FERNALD.

To a botanist who is familiar with the Maidenhair Fern, *Adiantum pedatum*, of rich deciduous woods of New England and the Alleghenies, and who looks upon that species as the northernmost American representative of a large tropical and subtropical genus, it is a

great surprise to find on the Shickshock Mountains of the Gaspé Peninsula a beautiful Adiantum covering hundreds of acres of alpine tableland. There, on the naked tableland of Mt. Albert and along the ice-cold streams of the alpine district, is an Adiantum forming broad bands of blue-green wherever the water from the cold bogs or melting snow-fields trickles through crevices of the greenish-brown serpentine.

Ordinarily the plant is strongly caespitose, very many stiff glaucous stipes springing from the crowns of the firmly entangled rootstocks. These rigid stipes are rarely more than 2 decimeters high, often scarcely 1 dm., though exceptional clumps have stipes fully 2.5 dm. tall. The blue-green fronds are from 0.5 to 2 dm. across, and the pinnae usually strongly ascending, without the long graceful curve which in *A. pedatum* causes the tips of the primary branches nearly to meet. In exposed sunny situations the small firm pinnules are peculiarly twisted, but in sheltered ravines they are quite flat and normal.

The plant is evidently a close ally of our Alleghenian *Adiantum pedatum*, but careful comparison with this plant of the woodlands shows the Mt. Albert fern to have certain characters which are noteworthy. Besides its small stature, ascending scarcely recurved pinnae and very firm texture the Adiantum of the Shickshocks differs in having the lower marginal rib of the pinnules more prominent, while the finer veins of the pinnules are more obscure than in *A. pedatum*. The teeth at the tips of the pinnules of the Mt. Albert plant are acute and often very fine, while those of the Alleghenian *A. pedatum* are rounded. But the best character, perhaps, is in the indusium. In *A. pedatum* this is transversely linear, varying much in length (usually from 2 to 5 mm. long) but always of a linear or short-oblong outline (about 1 mm. broad). In the Mt. Albert plant the indusia are more lunate, rarely twice as long as broad.

Study of the material in the Gray Herbarium shows that the plant of Mt. Albert, though usually dwarfed, is the characteristic Adiantum of wet rocks and mountain-gulches from Idaho and California north to Alaska, where it has passed as *A. pedatum*, and that it reappears in northeastern Asia. It is unquestionably the fern listed without description by Presl as *Adiantum boreale* "(A. pedatum ex Unalaschka *Kaulf. et herb. Chamisso*)," [1] which was afterward taken up and

[1] Presl, Tent. Pterid. 158 (1836).

described by Ruprecht as *A. pedatum*, var. *aleuticum*.[1] Ruprecht's material was from Unalaschka and Kadiak Island, and specimens from that region are clearly identical with those from Mt. Albert. Occasional specimens from northwestern America and some from eastern Asia show very evident transitions to typical *A. pedatum*, and, although he failed in his diagnosis to point out some leading characteristics of the fern, it is probable that Ruprecht's treatment of the plant was best and that it should be known as *Adiantum pedatum* L., var. *aleuticum* Ruprecht.

Gray Herbarium.

RECENTLY RECOGNIZED SPECIES OF CRATAEGUS IN EASTERN CANADA AND NEW ENGLAND, — VI.

C. S. Sargent.

(*Continued from page 185.*)

Punctatae.

Stamens 20; anthers pale rose.

Crataegus umbratilis, n. sp. Leaves obovate to rhombic or suborbicular, acute or short-pointed and acuminate at the apex, gradually narrowed and concave-cuneate at the long entire base, sharply doubly serrate above, with straight glandular teeth, and divided above the middle into 3 or 4 pairs of short broad acute lobes, about half-grown when the flowers open at the end of May and then membranaceous, glabrous with the exception of a few pale hairs along the upper side of the midribs and veins, light yellow-green, smooth and lustrous above and pale below, and at maturity thin, glabrous, dark yellow-green and lustrous on the upper and paler on the lower surface, 6–7 cm. long and 5–7 cm. wide, with thin orange-colored midribs, and slender inconspicuous primary veins extending obliquely to the points of the lobes; petioles slender, broadly wing-margined at the apex, deeply grooved, glabrous, glandular, with occasional scattered persistent glands, 2–3 cm. in length; leaves on vigorous shoots more

[1] Ruprecht, Distrib. Crypt. Vasc. in Imp. Ross. 49 (1845).

coarsely serrate and more deeply lobed and often 3–8 cm. long and broad. Flowers 2–5 cm. in diameter, on long stout glabrous pedicels, in generally 5–12-flowered broad lax corymbs, the lower branches from the axils of upper leaves; calyx broadly obconic, glabrous, tinged with red, the lobes gradually narrowed, short-acuminate, finely glandular-serrate above the middle, green, glabrous on the outer, sparingly villose on the inner surface, reflexed after anthesis; stamens 20; anthers large, pale rose color; styles 5. Fruit ripening in September, on stout erect pedicels, in few-fruited clusters, subglobose to short-oblong, bright apple-green (September 19th), about 1 cm. in diameter; calyx prominent, with a wide deep cavity and small spreading and reflexed lobes hairy on the upper side and mostly persistent; flesh thin, green, dry and mealy; nutlets 5, full and rounded at the base, acute at the apex, rounded or occasionally obscurely ridged on the back, dark-colored, about 7 mm. long and 5–6 mm. wide.

A tree about 5 m. high, with a short trunk 20–25 cm. in diameter, covered with pale gray scaly bark, large spreading and ascending branches forming a wide open irregular head, and slender nearly straight branchlets marked by oblong pale lenticels, glabrous and deeply tinged with red when they first appear, soon becoming light orange-brown, light gray tinged with red in their second year, and armed with numerous slender nearly straight bright chestnut-brown shining spines 3.5–4.5 cm. long, elongated, much-branched, and very abundant on the trunk and branches.

Borders of Alder thickets in low moist ground in the shade of larger trees, Goddard estate near Litchfield, Litchfield County, Connecticut, *C. H. Bissell* (no. 67, type!), September 20, 1903, May, 1904; *Bissell* and *Sargent*, September 3, 1905.

Pruinosae.

Stamens 20; anthers pink.

Crataegus fusca, n. sp. Leaves ovate, acuminate, rounded, cuneate or almost truncate at the broad entire base, sharply often doubly serrate above, with straight glandular teeth, and divided into 4–6 pairs of narrow acuminate spreading lobes, nearly one-third grown when the flowers open about the 1st of June and then thin, yellow-green slightly tinged with red, and glabrous with the exception of a few scattered pale caducous hairs above and pale and glabrous below, and at maturity thin, bluish green and lustrous on the upper and paler blue-green on the lower surface, 4.5–7 cm. long and 4–5.5 cm. wide, with slender yellow midribs, and thin primary veins

arching obliquely to the points of the lobes; petioles slender, slightly wing-margined at the apex, occasionally sparingly glandular, 2–3.5 cm. in length; leaves on vigorous shoots rounded or sometimes cordate at the base, coarsely serrate and more deeply lobed, with stout wing-margined glandular rose-colored petioles. Flowers about 2 cm. in diameter, on short slender glabrous pedicels, in usually 4–7-flowered corymbs, with linear acuminate glandular rose-colored bracts and bractlets mostly deciduous before the flowers open; calyx-tube broadly obconic, the lobes short, gradually narrowed, acuminate, minutely glandular on the margins, glabrous, reflexed after anthesis; stamens 20; anthers pale pink; styles 4 or 5. Fruit ripening the middle of October, on short stout erect pedicels, in few-fruited clusters, short-oblong, full and rounded at the apex, slightly narrowed at the base, dull brown, pruinose, 1–1.2 cm. in diameter; calyx prominent, with a short tube, a broad deep cavity and spreading and reflexed lobes dark red on the upper side below the middle; flesh thin, yellow-green, dry and mealy; nutlets usually 4 or 5, broad and rounded at the base, gradually narrowed and rounded at the apex, ridged on the back, with a high narrow ridge, light-colored, 7–8 mm. long and 4–5 mm. wide.

A tree with a short trunk and spreading branches forming a round-topped head, and slender nearly straight branchlets marked by oblong pale lenticels, orange-green more or less tinged with red when they first appear, bright chestnut-brown and lustrous during their first year and light gray tinged with red the following season, and armed with slender slightly curved purplish shining spines 4–5 cm. long.

Pastures near Burlington, Vermont, *W. W. Eggleston* (nos. 2282, 2346, 2874 type!), September and October 1901, May and June 1902, June 1903.

Anthers rose-color.
Stamens 15–20.

Crataegus Quinebaugensis, n. sp. Leaves rhombic, acuminate, cuneate and entire at the base, finely often doubly serrate above, with slender glandular teeth, and divided above the middle into 2 or 3 pairs of broad short acuminate lobes, nearly one-third grown when the flowers open about the 20th of May and then thin and glabrous, light yellow-green and very smooth above and pale bluish green below, and at maturity subcoriaceous, dark blue-green and lustrous on the upper and pale blue-green on the lower surface, 6–7 cm. long and 5–6 cm. wide, with slender yellow midribs, and thin primary veins extending obliquely to the points of the lobes; petioles slender, slightly wing-margined at the apex, nearly terete, glandular, with minute dark red stipitate deciduous glands, 2–3 cm. in length; stip-

ules linear-obovate, glandular, fading rose color or brown, mostly fallen before the flowers open; leaves on vigorous shoots more coarsely serrate and more deeply lobed, often 8–10 cm. long and 7–8 cm. wide, with stout petioles conspicuously glandular through the season, and foliaceous lunate coarsely serrate persistent stipules. Flowers 1.6–1.9 cm. in diameter, on elongated slender glabrous pedicels, in usually 5–7-flowered corymbs, with linear-obovate acuminate glandular bracts and bractlets usually persistent until after the flowers open; calyx-tube broadly obconic, glabrous, the lobes wide, short-acuminate, usually dentate above the middle, with minute glandular teeth, reflexed after anthesis; stamens 15–20, usually 16–18; anthers pale rose color; styles 3–5. Fruit ripening in October and falling before the end of the month, on slender pendulous pedicels, in few-fruited clusters, oblong to slightly obovate, usually pointed and more or less angled at the base, gradually narrowed at the apex, light red or purplish, pruinose, 1–1.2 cm. long and 8–9 mm. wide; calyx little enlarged, with a short tube, a deep narrow cavity, and spreading and reflexed usually persistent lobes; flesh thin, hard and dry, greenish or yellowish white, sometimes tinged with red; nutlets 3 or 4, narrowed at the ends, acute at the apex, ridged on the back, with a low broad slightly grooved ridge, about 8 mm. long and 4–5 mm. wide.

A sparingly branched shrub 2–4 m. high, with long spreading and ascending stems covered with pale gray bark darker and rougher near their base, and stout zigzag branchlets marked by small oblong dark lenticels, orange-brown and glabrous when they first appear, dull olive or olive-brown during their first year, becoming gray-brown the following season, and armed with many slender slightly curved purplish shining spines 5–7 cm. long.

Near Hopeville, New London County, Connecticut, in the valley of the Quinebaug River, *C. B. Graves* (no. 57 type!), May, July and October 1904.

Stamens 10 or less.

CRATAEGUS BELLULA, Sarg., *Trees and Shrubs*, i. 111, t. 56. (1903.) I have referred to this species, known previously only in the neighborhood of Grand Rapids, Michigan, a large nearly aborescent plant discovered in Somerset, Massachusetts, by Mr. J. G. Jack (no. 6), May and September 1903. If this reference is correct *Crataegus bellula* is interesting as another instance of the occurrence of a species of this genus in remote regions without intermediate stations, for the country between southern Massachusetts and central Michigan has been so carefully examined for Crataegus that it is hardly prob-

able that such a distinct and beautiful plant as *C. bellula* could if generally distributed have escaped notice.

Crataegus incisa, n. sp. Leaves ovate-oblong, acuminate, cuneate or rounded at the entire glandular base, sharply doubly serrate above, with straight or incurved glandular teeth, and deeply divided into numerous narrow acuminate spreading sometimes reflexed lateral lobes, more than half grown when the flowers open from the 20th to the end of May and then membranaceous, light yellow green, smooth and glabrous above, and pale or glaucous and slightly hairy along the midribs and veins below, and at maturity subcoriaceous, dark blue-green and lustrous on the upper and pale-green on the lower surface, 5–8 cm. long and 4–6 cm. wide, with prominent yellow midribs, and slender obscure primary veins arching obliquely to the points of the lobes; petioles slender, slightly wing-margined at the apex, nearly terete, yellow, sometimes glandular while young, with minute dark red deciduous glands, 2–3 cm. in length; leaves on vigorous shoots ovate, truncate or rounded at the broad base, coarsely serrate, 3-lobed by deep narrow sinuses, the terminal lobe incisely lobed, coriaceous, 7–9 cm. long and wide, with stout winged conspicuously glandular petioles, and foliaceous lunate long-pointed laciniately divided stipules. Flowers 1.8–2 cm. in diameter, on slender elongated glabrous pedicels, in lax 4–6-flowered corymbs, with linear acuminate glandular bracts and bractlets, fading brown and mostly deciduous before the flowers open; calyx-tube narrowly obconic, glabrous, the lobes gradually narrowed from wide bases, acute and glandular at the apex, entire or finely glandular-serrate near the middle, glabrous, reflexed after anthesis; stamens 5–10; anthers pale rose color; styles usually 3, surrounded at the base by a narrow ring of pale hairs. Fruit ripening late in October, and persistent until after the fall of the leaves on erect or spreading pedicels, in compact few-fruited clusters, obovate, full and rounded at the apex, gradually narrowed to the base, green covered with a glaucous bloom, late in the season often becoming crimson or tinged with crimson, 1.3–1.5 cm. long and 1–1.2 cm. wide; calyx little enlarged, without a tube, and with a narrow shallow cavity and spreading lobes, their tips often deciduous from the ripe fruit; flesh thin, hard and green; nutlets 3, gradually narrowed to the rounded ends, ridged on the back, with a broadly grooved ridge, about 8 mm. long and 5 mm. wide.

A shrub or small tree 3–4 m. high, with slender stems, and stout slightly zigzag branchlets marked by small dark lenticels, green tinged with red when they first appear, soon becoming bright red-brown and very lustrous, and dark dull gray-brown in their second year, and armed with slender straight or slightly curved shining spines 3.5–5 cm. long.

In dry soil near ledges, Stratford, Fairfield County, Connecticut,

E. H. Eames (nos. 144 type! 3495 and 3595), June and September 1901, May and September 1903.

Crataegus Robbinsiana, n. sp. Leaves ovate, acute or acuminate, rounded, truncate or cordate at the entire or crenate base, finely doubly serrate above, with straight glandular teeth, and more or less divided into 4 or 5 pairs of spreading acuminate lateral lobes, when they unfold deeply tinged with red, glabrous below and furnished above with short white hairs, nearly fully grown when the flowers open from the middle to the 20th of May and then membranaceous, pale yellow-green and still hairy above and pale below, and at maturity thin but firm in texture, smooth and dark green on the upper, pale on the lower surface, 3–5 cm. long and 2.5–3.5 cm. wide, with slender yellow midribs, and thin primary veins extending obliquely to the points of the lobes, often turning orange color tinged with red in the autumn before falling; petioles slender, slightly wing-margined at the apex, glandular, with minute stipitate dark glands, 1.4–2 cm. in length; stipules linear to linear-falcate, acuminate, finely glandular-serrate, mostly deciduous before the flowers open; leaves on vigorous shoots broadly ovate, mostly long-pointed, cordate or rarely truncate at the base, more coarsely serrate, more deeply lobed and frequently 6–7 cm. long and 5–6 cm. wide, with stout reddish conspicuously glandular petioles 1–2 cm. long. Flowers 1.2–1.5 cm. in diameter, on slender glabrous pedicels, in 6–10-flowered corymbs, with linear glandular bracts and bractlets fading brown and mostly deciduous before the flowers open; calyx-tube broadly obconic, glabrous, the lobes gradually narrowed from wide bases, acuminate at the gland-tipped apex, entire or slightly and irregularly toothed near the middle, reflexed after anthesis; stamens 7–10; anthers light rose color; styles 4 or 5, surrounded at the base by a ring of pale tomentum. Fruit ripening from the first to the middle of October, on slender pedicels, in few-fruited erect clusters, depressed-globose, rather broader than high, dull red and slightly pruinose, becoming lustrous and about 1.2 cm. in diameter; calyx little enlarged, without a tube, and with a deep narrow cavity, and spreading appressed lobes bright red on the upper side below the middle and mostly persistent on the ripe fruit; flesh thin, hard, greenish white; nutlets 4 or 5, full and rounded at the base, narrow and rounded at the apex, ridged on the back, with a high ridge, 6–7 mm. long and 4–5 mm. wide.

A tree occasionally 10 m. high, with a tall trunk 20–25 cm. in diameter, covered with light gray closely appressed scales, comparatively small erect branches forming an open erect head, and slender slightly zigzag branchlets marked by numerous dark lenticels, green tinged with red and glabrous when they first appear, bright chestnut-brown and lustrous during their first winter and pale gray-brown the following season, and armed with many slender or occasionally

stout nearly straight bright red-brown shining spines 3–4 cm. long; usually smaller and sometimes shrubby in habit.

Burlington, Vermont, *W. W. Eggleston* (no. 3475 type!), October 1903, May 1904, (no. 3472) October 1903, *A. W. Edson*, May 1900. Putney, Vermont, *W. W. Eggleston* (nos. 3391 & 3392), May and September 1903, *W. H. Blanchard* (no. 46), May and September 1903; Westminster, Vermont, *W. H. Blanchard* (no. 49), September 1902, May 1903; *Blanchard* and *Sargent*, May 1905. North Walpole, New Hampshire, *W. H. Blanchard* (no. 48), May and September 1903.

This handsome and widely distributed species is named in memory of James Watson Robbins (1801–1879) in his time "the most critical student of the botany of New England and the northern Atlantic States."

Crataegus levis, n. sp. Leaves ovate to oval, acute or acuminate, abruptly cuneate or rounded at the entire base, finely doubly serrate above, with straight or incurved glandular teeth, and slightly divided above the middle into 4 or 5 pairs of short acuminate lobes, when the flowers open during the last week of May thin, glabrous with the exception of a few soft hairs on the light yellow-green very smooth upper surface and pale or glaucous and glabrous below, and at maturity thin, but firm in texture, glabrous, blue-green above and pale blue-green below, 3.5–4.5 cm. long and 3–3.5 cm. wide, and on vigorous shoots sometimes 6 cm. long and 4–5 cm. wide, with very slender yellow midribs, and thin primary veins arching obliquely to the points of the lobes; petioles slender, nearly terete, glandular while young, with occasional minute dark red glands, often tinged with red early in the season, 2–3 cm. in length. Flowers 1.2–1.4 cm. in diameter, on stout elongated glabrous pedicels, in usually 5–8-flowered corymbs; calyx-tube narrowly obconic, glabrous, the lobes gradually narrowed from wide bases, short, acuminate, obscurely serrate near the middle, glabrous, reflexed after anthesis; stamens 7–10; anthers deep rose color; styles 3 or 4. Fruit ripening the end of September, on drooping pedicels, in few-fruited clusters, obovate, full and rounded at the apex, gradually narrowed to the slender base, dull purple, very glaucous, 1.1–1.3 cm. long and 7–8 mm. wide; calyx little enlarged, with a wide shallow cavity, and spreading or reflexed serrate lobes dark red on the upper side toward the middle, their tips often deciduous from the ripe fruit; flesh thin, yellow, rather juicy; nutlets 3 or 4, usually 3, narrowed and rounded at the base, acute or acuminate at the apex, ridged on the back, with a high usually broad ridge, about 7 mm. long, and 4–5 mm. wide.

A slender shrub about 2 m. high, with small ascending stems and

branches covered with dark scaly bark, and slender nearly straight branchlets marked by small oblong lenticels, dull orange color and glabrous when they first appear, light chestnut-brown and lustrous during their first winter and dull reddish brown in their second year, and armed with slender nearly straight light chestnut-brown shining ultimately dull gray-brown spines 3–4 cm. long.

Moist rich pastures, Litchfield, Litchfield County, Connecticut, *C. H. Bissell* (no. 71 type!), September 1903, May 1904; *Bissell* and *Sargent*, September 1905.

Tenuifoliae.

Anthers rose color.
Stamens 10 or less.

Crataegus culta, n. sp. Leaves ovate, acuminate, broad and rounded at the entire base, finely doubly serrate above, with straight glandular teeth, and slightly divided into 5 or 6 pairs of slender acuminate lobes, about half grown when the flowers open the middle of May and then dark yellow-green and roughened above by short white hairs and pale bluish green and glabrous below, and at maturity thick and firm, glabrous, dark blue-green on the upper and paler on the lower surface, 4–5 cm. long and 3–4 cm. wide, with stout midribs rose-colored below toward the base in the autumn, and slender obscure primary veins extending obliquely to the points of the lobes; petioles slender, grooved and sparingly villose while young on the upper side, soon glabrous, glandular, with minute dark often persistent glands, rose-colored in the autumn, 1.5–3 cm. in length. Flowers about 1.5 cm. in diameter, on slender elongated glabrous pedicels, in broad lax usually 10–12-flowered corymbs, with linear glandular caducous bracts and bractlets; calyx-tube narrowly obconic, glabrous, the lobes slender, long-pointed and acuminate at the rose-colored glandular apex, entire or sparingly dentate near the middle, glabrous, reflexed after anthesis; stamens 5–10; filaments rose color, persistent on the fruit; anthers dark rose color; styles 3 or 4. Fruit ripening and falling late in September, on slender drooping pedicels, in few-fruited clusters, short-oblong or ovate to subglobose, depressed at the insertion of the stalk, crimson, lustrous, marked by minute pale dots, 1–1.3 cm. long; calyx little enlarged with a narrow deep cavity, and spreading or reflexed lobes abruptly narrowed from broad bases, long-pointed, entire or obscurely and irregularly dentate, dark red on the upper side below the middle, mostly persistent on the ripe fruit; flesh thin, slightly juicy, greenish yellow; nutlets usually 3, rounded at the ends or, when 4, acute at the apex, ridged on the back, with a broad low grooved ridge, dark-colored, about 5 mm. long and nearly as wide.

A shrub 3–4 m. high, with long slender much branched stems forming an open irregular head, and slender nearly straight branchlets marked by crowded pale lenticels, dark green tinged with red when they first appear, becoming purple and rather lustrous during their first season and dull reddish brown the following year, and armed with short purplish shining ultimately gray spines 3–4 cm. long and persistent on the old branches and stems.

Rich moist hillsides, Shirley, Middlesex County, Massachusetts, *C. S. Sargent* (no. 5 type!), September 1902, *E. F. Thayer*, September 1904, May and June 1905. *Thayer* and *Sargent*, September 1905.

Crataegus Damei, n. sp. Leaves oblong-ovate or rarely oval, long-pointed and acuminate at the apex, rounded or cuneate at the entire base, sharply doubly serrate above, with slender glandular teeth, and divided into 5 or 6 pairs of narrow acuminate lobes usually pointing forward, deeply tinged with red when they unfold, nearly fully grown when the flowers open the middle of May and then membranaceous, yellow-green and roughened above by short rigid hairs and pale or glaucous and glabrous below, and at maturity very thin, dark blue-green and smooth or slightly roughened above and pale below, 4.5–5.5 cm. long and 3.5–4 cm. wide, with slender yellow midribs, and thin primary veins arching obliquely to the points of the lobes; petioles slender, grooved on the upper side, glabrous, 2–2.5 cm. in length; leaves on vigorous shoots broader in proportion to their length and often truncate at the base. Flowers about 1.5 cm. in diameter, on slender elongated glabrous pedicels, in compact usually 5–7-flowered corymbs; calyx-tube narrowly obconic, glabrous, the lobes slender, entire, acuminate, red and glandular at the acuminate apex, glabrous on the outer, slightly villose on the inner surface, reflexed after anthesis; stamens 10; anthers light pink; styles 2–4, surrounded at the base by a narrow ring of pale hairs. Fruit ripening at the end of September, on long slender drooping pedicels, in many-fruited clusters, oblong to obovate, gradually narrowed at the base, full and rounded at the apex, bright cherry red and lustrous, marked by numerous minute dots, 1.3–1.5 cm. long, about 8 mm. wide; calyx small, with a deep narrow cavity, and slender entire lobes red on the upper side below the middle and spreading or incurved; flesh thin, yellow, rather juicy; nutlets 2–4, narrowed and rounded at the base, acute at the apex, ridged on the back, with a high narrow ridge, about 7 mm. long and 4 mm. wide.

A shrub 4–5 m. high, with numerous slender spreading stems forming a wide open head, and very slender nearly straight branchlets marked by small dark lenticels, light orange-green and glabrous when they first appear, becoming chestnut-brown and somewhat lustrous during their first winter, dull reddish brown the following year, ulti-

mately ashy gray, and armed with occasional stout straight curved purplish spines 1.5–3 cm. long.

Banks of the Merrimack River near Lowell, Massachusetts, *Dame* and *Sargent*, September 1902, *C. S. Sargent*, May 1905.

This species, well distinguished by its very thin dark blue-green leaves and long narrow mostly pear-shaped fruits hanging on long slender stalks is named for the late Lorin Low Dame (1838–1903), one of the authors of *The Flora of Middlesex County, Massachusetts*, of *Typical Elms and other Trees of Massachusetts*, and of a *Handbook of the Trees of New England*, by whom it was first pointed out to me.

Crataegus serena, n. sp. Leaves ovate, acuminate, concave-cuneate or sometimes rounded at the broad base, finely often doubly serrate, with straight or incurved glandular teeth, and divided into 4 or 5 pairs of short broad acute spreading lobes, when they unfold deeply tinged with red especially on the lower surface and covered above with soft white hairs, about one-third grown when the flowers open from the 20th to the end of May and then thin, yellow-green and scabrate above and pale and glabrous below, and at maturity thin but firm in texture, dark dull yellow-green on the upper and paler on the lower surface, 5–6.5 cm. long and 3–5 cm. wide, with stout yellow midribs, and thin prominent primary veins arching obliquely to the points of the lobes; petioles slender, wing-margined at the apex, nearly terete, glabrous, glandular near the apex, with minute often persistent glands, 2–3 cm. in length; stipules linear-obovate, acute, glandular, fading brown, caducous; leaves on vigorous shoots long-pointed and divided by wide shallow sinuses, often 6–7 cm. long and wide, with stout conspicuously glandular rose-colored petioles. Flowers 1.5–1.7 cm. in diameter, on slender glabrous pedicels, in broad lax long-branched many-flowered crowded corymbs, with linear glandular caducous bracts and bractlets; calyx-tube narrowly obconic, glabrous, the lobes slender, acuminate, glandular on the margins and at the apex with large dark red glands, glabrous, spreading or reflexed after anthesis; stamens usually 7; anthers rose-colored; styles 3. Fruit on long slender drooping pedicels, in few-fruited clusters, oblong, full and rounded at the ends, scarlet, lustrous, marked by large pale lenticels, about 1.5 cm. long and 1 cm. wide; calyx enlarged, with a deep narrow cavity, and incurved slightly serrate lobes mostly persistent on the ripe fruit; flesh yellow, soft and sweet; nutlets 3, gradually narrowed and rounded at the ends, ridged on the back, with a broad, high ridge, about 7 mm. long and 4–5 mm. wide.

A shrub sometimes 5–7 m. high, with numerous slender erect many-branched stems spreading into broad thickets, and slender nearly straight branchlets marked by small pale lenticels, dark green tinged with red when they first appear, becoming light chestnut-red

and rather lustrous in their first season and light gray-brown the following year, and armed with numerous slender nearly straight bright red-brown shining spines usually 2–3 cm. long.

Roadsides and pastures, Lenox, Berkshire County, Massachusetts, common, *C. S. Sargent*, September and October 1902, May 1904.

Crataegus Paddockeae, n. sp. Leaves oblong ovate to oval, long-pointed and acuminate at the apex, full and rounded or rarely cuneate at the glandular base, finely doubly serrate above, with straight glandular teeth, and slightly divided into 5 or 6 pairs of small narrow acuminate lateral lobes, when they unfold slightly tinged with red, roughened above by short white hairs and glabrous below, more than half grown when the flowers open about the 20th of May and then very thin, light yellow-green and scabrate above, pale and glaucous below, and at maturity thin but firm in texture, dark yellow-green, smooth and lustrous on the upper and pale on the lower surface, 5.5–7 cm. long and 4.5–5 cm. wide, with stout yellow midribs, and slender primary veins arching obliquely to the points of the lobes, petioles slender, slightly wing-margined at the apex, nearly terete, glabrous, glandular, with scattered persistent glands, rose-colored in the autumn, 2–2.5 cm. in length; leaves on vigorous shoots often cordate at the base, coarsely serrate, more deeply lobed, with broad, spreading lobes, thick and leathery, often 7–8 cm. long and broad, with dark rose-colored midribs and stout conspicuously glandular petioles. Flowers small (petals not seen), on slender elongated glabrous pedicels, in mostly 10–12-flowered corymbs; calyx-tube narrowly obconic, glabrous, the lobes slender, acuminate and red at the apex, entire, or sparingly glandular near the middle, glabrous on the outer, slightly villose on the inner surface, reflexed after anthesis; stamens 10; anthers small, rose color; styles 3 or 4. Fruit ripening by the middle of September, on slender elongated reddish drooping pedicels, in few-fruited clusters, short-oblong to obovate, full and rounded at the apex, narrowed below, lustrous, 1–1.2 cm. long, 8–10 mm. wide; calyx little enlarged, with a wide deep cavity and closely appressed lobes slightly hairy on the upper side, persistent on the ripe fruit; nutlets 3 or 4, full and rounded at the base, gradually narrowed and rounded or acute at the apex, irregularly ridged on the back, with a high slightly grooved ridge, 6–7 mm. long and about 4 mm. wide.

A shrub 5–6 m. high, with numerous stems, spreading branches, and slender slightly zigzag branchlets marked by numerous small pale lenticels, dark orange-yellow and glabrous when they first appear, light chestnut-brown and very lustrous during their first winter and dull dark red-brown the following year, and armed with many slender straight or slightly curved bright chestnut-brown shining spines 4–6 cm. long and usually pointed toward the base of the branch.

Valley of the Passumpsic River, Essex County, Vermont, *W. W. Eggleston*, north of Lyndonville (no. 3400 type!), Bloomfield (no. 3406).

This species is named for Miss Isabel Monteith Paddock, curator of the botanical department of the Fairbanks Museum of Natural Science, St. Johnsbury, Vermont.

Crataegus Napaea, n. sp. Leaves oblong-ovate, abruptly narrowed and long-pointed at the acuminate apex, rounded at the gradually narrowed base, sharply often doubly serrate, with straight glandular teeth, and deeply divided into 4 or 5 pairs of acuminate spreading lobes, more than half-grown when the flowers open about the 20th of May and then membranaceous, dark yellow-green, covered with short white hairs, and smooth and lustrous above and pale below, and at maturity thin, yellow-green and lustrous on the upper and pale on the lower surface, 7–9 cm. long and 5–7 cm. wide, with thin orange-colored midribs, and slender primary veins arching obliquely to the points of the lobes; petioles slender, wing-margined at the apex, nearly terete, glandular, with scattered persistent glands, rose-colored in the autumn, 3.5–4 cm. in length; leaves on vigorous shoots longer-pointed, often gradually narrowed and cuneate at the base, coarsely serrate, deeply lobed, often 9–10 cm. long and occasionally not more than 5–6 cm. wide, with stout broadly winged petioles. Flowers small (petals not seen), on long slender glabrous pedicels, in lax many-flowered corymbs, the lower branches from the axils of upper leaves; calyx narrowly obconic, glabrous, the lobes slender, elongated, acuminate, red at the apex, entire or sharply serrate near the middle, glabrous, reflexed after anthesis; stamens 5–7; filaments persistent on the fruit; anthers rose colored; styles 3 or 4, usually 4. Fruit ripening about the 20th of September, on long slender drooping pedicels, in few-fruited clusters, oblong-obovate, dull red, 1–1.2 cm. long and 8–9 mm. wide; calyx prominent, with a wide shallow cavity, and small closely appressed persistent lobes; flesh thick, yellow, dry and mealy; nutlets usually 4, gradually narrowed and acute at the ends, very slightly ridged on the rounded back, 6–7 mm. long and about 5 mm. wide.

An arborescent shrub 5–6 m. high, with numerous stout ascending much branched stems spreading into broad thickets, and slender nearly straight branchlets marked by numerous small pale lenticels, dark olive-green tinged with red when they first appear, light chestnut-brown and lustrous during their first winter and dull reddish brown in their second year, and armed with slender nearly straight or curved light chestnut-brown shining spines 4–5 cm. long.

Low moist soil near the banks of a deep ravine on the Goddard Estate, near Litchfield, Litchfield County, Connecticut, *C. H. Bissell*

(no. 68 type!), May and September 1904, *Bissell* and *Sargent*, September 1905; Cornwall, Connecticut, *C. H. Bissell* (no. 54), May and September 1903.

Crataegus viridimontana, n. sp. Leaves ovate, long-pointed and acuminate at the apex, gradually narrowed and concave-cuneate at the glandular base, finely doubly serrate above, with incurved glandular teeth, and deeply divided into 5 or 6 pairs of slender acuminate spreading lobes, when they unfold tinged with red and coated with silky white hairs more abundant on the lower than on the upper side, nearly half grown when the flowers open about the 25th of May and then membranaceous, light yellow-green and roughened above by short white hairs and pale and glabrous below, and at maturity thick and firm in texture, dark green, lustrous and scabrate on the upper and pale on the lower surface, 5–5.5 cm. long and 4–5 cm. wide, with slender yellow midribs, and thin primary veins arching obliquely to the points of the lobes; petioles slender, slightly wing-margined at the apex, glabrous, glandular toward the apex, rose-colored when they first appear, soon yellow, 2.5–3 cm. in length; stipules linear, glandular, fading rose color, caducous; leaves on vigorous shoots oblong-ovate to rhombic, long-pointed, cuneate at the base, coarsely serrate, deeply divided into broad spreading lobes, 7–9 cm. long and 5–7 cm. wide, with stout broadly winged conspicuously glandular petioles, and foliaceous lunate coarsely glandular-serrate persistent stipules. Flowers 1.6 cm. in diameter, on long slender glabrous pedicels, in mostly 5–9-flowered corymbs, with linear glandular caducous bracts and bractlets; calyx-tube narrowly obconic, glabrous, the lobes gradually narrowed from wide bases, elongated, acuminate and glandular at the apex, entire or sparingly glandular toward the middle, glabrous, reflexed after anthesis; stamens 5–10; anthers large, dark rose color; styles 2–4, usually 4, surrounded at the base by a narrow ring of pale tomentum. Fruit ripening from the middle to the end of August and persistent for nearly another month, on slender elongated reddish pedicels, in few-fruited drooping clusters, short-oblong, full and rounded at the ends, crimson, slightly pruinose, marked by numerous small pale dots, 1.2–1.5 cm. long and about 1 cm. wide; calyx little enlarged, with a deep narrow cavity, and erect often incurved lobes only slightly glandular-serrate toward the base; flesh yellow, thick, soft and succulent; nutlets usually 4, gradually narrowed at the ends, rounded at the base, often acute at the apex, prominently ridged on the back, with a wide grooved ridge, dark-colored, 6–7 mm. long and about 5 mm. wide.

A shrub 5–7 m. high, with slender ascending stems forming an open irregular head, and stout nearly straight branchlets marked by numerous small pale lenticels, orange-green and glabrous when they first appear, bright chestnut-brown and very lustrous during their first winter, becoming pale gray-brown, and armed with numerous

stout nearly straight light chestnut-brown shining spines 3–3.5 cm. long.

In shady upland woods, East Middlebury, Vermont *Ezra Brainerd* (no. 109 type!), July and September 1900, May, July and August, 1901.

This species differs from *C. matura*, Sarg., to which it was first doubtfully referred, in its larger and more deeply lobed and much thicker leaves, larger fruit, and in its habit. As noted by President Brainerd *C. viridimontana*, more than any other species of western Vermont, grows in woods in the dense shade of other trees.

Stamens 18–20.

Crataegus Edsoni, n. sp.

Crataegus matura, Sarg., RHODORA, iii. 24 (1901) so far as relates to the flowers (see RHODORA, v. 144).

Leaves oblong-ovate to oval, acuminate, gradually narrowed and rounded or cuneate at the base, sharply often doubly serrate, with straight or incurved glandular teeth, and divided above the middle into 4 or 5 pairs of short broad acuminate spreading lobes, when they unfold deeply tinged with red and roughened above by short white hairs and sparingly villose below along the midribs and veins, when the flowers open during the last week in May membranaceous, light yellow-green above and pale below, and at maturity thin, dark yellow and smooth on the upper and paler on the lower surface, 6–8 cm. long and 5–6 cm. wide, with slender yellow midribs, and thin veins extending obliquely to the points of the lobes, turning dull orange color early in the autumn; petioles slender, narrowly wing-margined at the apex, nearly terete, glandular above the middle, with large persistent glands, 2–3 cm. in length; stipules linear, acuminate, glandular, caducous, leaves on vigorous shoots long-pointed, coarsely serrate, more deeply lobed, often 8–9 cm. long and 7 cm. wide, with stout petioles broadly winged to below the middle and often rose-colored toward the base in the autumn. Flowers about 1.8 cm. in diameter, on long slender glabrous pedicels, in compact usually 7- or 8-flowered corymbs, with linear-obovate glandular bracts and bractlets; calyx-tube narrowly obconic, glabrous, the lobes slender, red and glandular at the acuminate apex, entire or occasionally dentate near the base, glabrous, reflexed after anthesis; stamens 18–20; filaments persistent, dark red and conspicuous on the fruit; anthers pink; styles 3–5, surrounded at the base by a narrow ring of pale tomentum. Fruit ripening early in September, on slender drooping reddish pedicels, in many-fruited clusters, subglobose to short-oblong on obovate, bright cherry red, lustrous, marked by small pale dots, 1.3–1.5 cm. in diameter; calyx little enlarged, with a broad deep cav-

ity, and small closely appressed lobes dark red on the upper side below the middle, often deciduous from the ripe fruit; flesh thin, yellow, acidulous, of agreeable flavor; nutlets 3–5, narrowed and rounded at the ends, ridged, with a low narrow ridge, or rounded and grooved on the back, about 7 mm. long and 4–5 mm. wide.

A broad shrub, with spreading stems 2–3 m. high forming large clumps, slender nearly straight branchlets marked by small pale lenticels, light orange-yellow more or less tinged with red and glabrous when they first appear, dark orange-brown and lustrous in their first season and dull grayish or reddish brown the following year, and armed with numerous stout nearly straight bright chestnut-brown shining spines 2.5–3.5 cm. long.

Pastures in low moist soil, Burlington, Vermont, *A. W. Edson*, May 1900, *W. W. Eggleston* (nos. 2280 & 2870 type !), September 1901, May 1902, (nos. 2344 & 3476), May and October 1903; Westminster, Windham County, Vermont, *W. H. Blanchard* (no. 78), May and September 1903; North Walpole, Cheshire County, New Hampshire, *W. H. Blanchard* (no. 34), September 1902, May 1903, *W. W. Eggleston* (no. 2928), October 1902, May and September 1903; Lansingburg, Rensselaer County, New York, *Charles H. Peck* (no. 15 b), May and September 1903.

Crataegus Edsoni appears to be most closely related to *C. Forbesae*, Sarg., of central Massachusetts and Connecticut, differing from that species in its thinner and more deeply lobed leaves, pink, not dark red, anthers, and larger fruit. It is named for its discoverer, the late Arthur Woodbury Edson, a student at the University of Vermont and at the time of his death in June 1905 assistant physiologist in the Bureau of Plant Industry of the Department of Agriculture of the United States, in charge of experiments in Texas in breeding cotton. (See *Science*, n. ser. XXII. 61.)

Molles.

Stamens 10; anthers pale pink.

Crataegus lauta, n. sp. Leaves ovate, acuminate, broad and rounded or truncate or occasionally cuneate at the entire base, sharply doubly serrate above, with straight glandular teeth, and slightly divided into 5 or 6 pairs of small acuminate lateral lobes, about $\frac{1}{3}$ grown when the flowers open from the 15th to the 20th of May and then membranaceous, yellow-green and roughened above

by short white hairs and villose below along the midribs and veins, and at maturity thin, bluish green and scabrate on the upper and yellow-green on the lower surface, 6–7 cm. long and 5–6 cm. wide, with stout yellow midribs, and slender sparingly villose or pubescent primary veins; petioles slender, wing-margined at the apex, nearly terete, villose through the season, tinged with rose color at the base in the autumn, 2.5–3 cm. in length; stipules lanceolate, glandular, caducous; leaves on vigorous shoots slightly cordate at the broad base, coarsely serrate, more deeply lobed, thicker, often 10–12 cm. long and 8–9 cm. wide, with stout broadly winged conspicuously glandular petioles, and foliaceous lunate coarsely serrate persistent stipules. Flowers 2 cm. in diameter, on slender elongated villose pedicels, in compact hairy usually 8-12-flowered corymbs, with oblong-obovate to linear glandular bracts and bractlets mostly persistent until the flowers open; calyx tube narrowly obconic, clothed with matted pale hairs, the lobes broad, acuminate, coarsely glandular serrate usually only below the middle, glabrous on the outer, villose on the inner surface, reflexed after anthesis; stamens 10; anthers pale pink; styles 5, surrounded at the base by a narrow ring of pale tomentum. Fruit ripening at the end of September, on stout slightly villose drooping pedicels, in few-fruited clusters, short-oblong to oblong, full and rounded and pubescent at the ends, slightly concave at the insertion of the pedicels, bright orange-red, lustrous, marked by numerous small dark dots, 1.6–2 cm. long and 1.5–1.8 cm. wide; calyx only little enlarged, with a deep narrow cavity, and erect laciniately glandular-serrate lobes rose-colored on the inner side toward the base and persistent on the ripe fruit; flesh thick, yellow, slightly juicy, firm and hard; nutlets 5, narrow and rounded at the base, acute at the apex, slightly and irregularly ridged on the back, 8–9 mm. long and 5–6 mm. wide.

A pyramidal arborescent shrub, with erect stems covered with ashy gray bark, small spreading and ascending branches, and stout slightly zigzag branchlets marked by many small lenticels, green slightly tinged with red and sparingly villose when they first appear, soon glabrous and dark olive green and lustrous, light olive green in their second season, and armed with many stout nearly straight light chestnut-brown shining spines 4–5 cm. long.

The description of this plant is drawn from a specimen cultivated in Olmsted Park, Boston. This is one of 700 plants, all similar in habit and foliage and in the characters of the flowers and fruit planted in the Boston parks and raised about fifteen years ago at the Framingham nurseries in South Framingham, Massachusetts, from seeds produced by a plant still growing in the Harvard Botanic Garden. The origin of this plant is unknown. It is one of a collec-

tion of thorns, however, planted by me in the garden perhaps about 1875 and, like other trees and shrubs planted there at that time, it was probably raised from seeds at the Arnold Arboretum.

Flabellatae.

Stamens 5; anthers rose color.

Crataegus ampla, n. sp. Leaves ovate, acuminate, rounded, truncate or rarely cuneate at the base, sharply often doubly serrate, with slender straight glandular teeth, and divided into 5 or 6 pairs of broad acuminate lateral lobes, slightly tinged with red and villose on the upper surface when they unfold, nearly half grown when the flowers open about the 20th of May and then membranaceous, light yellow-green and roughened above by short lustrous white hairs and pale and glabrous below, and at maturity thin, dark yellow-green and scabrate on the upper and paler on the lower surface, 6–7 cm. long and 5–6.5 cm. wide, with stout yellow midribs, and slender primary veins arching obliquely to the points of the lobes; petioles slender, nearly terete, glabrous, glandular near the apex, with occasional minute usually persistent glands, rose-colored in the autumn, 1.5–3 cm. in length; stipules oblong-obovate, often falcate, glandular, fading brown, caducous; leaves on vigorous shoots truncate or slightly cordate at the base, more coarsely serrate and more deeply lobed, and 7–8 cm. long and broad. Flowers about 1.5 cm. in diameter, on slender elongated glabrous pedicels, in usually 7–10-flowered corymbs, with oblong-obovate to linear glandular rose-colored bracts and bractlets; calyx-tube broadly obconic, glabrous, the lobes wide, foliaceous, acuminate, coarsely laciniately serrate, glandular, with large dark red glands, glabrous on the outer, sparingly villose on the inner surface, spreading or reflexed after anthesis; stamens 5; anthers dark rose color; styles 3, surrounded at the base by a broad ring of hairy tomentum. Fruit ripening early in October, on slender drooping pedicels, in few-fruited clusters, obovate, rounded at the apex, gradually narrowed to the base, bright cherry red, lustrous, marked by small pale dots, about 1.2 cm. long and 1 cm. wide; calyx little enlarged, with a broad deep cavity and spreading appressed coarsely serrate lobes, their tips often deciduous from the ripe fruit; flesh thin, yellow, dry and mealy; nutlets 3, narrowed and rounded at the ends or acute at the apex, ridged on the back, with a broad high deeply grooved ridge, about 8 mm. long and 4–5 mm. wide.

A shrub 4–5 m. high, with numerous stout ascending many-branched stems covered with dark gray bark and forming a broad round-topped compact head, and slender, slightly zigzag branchlets marked by small oblong pale lenticels, dark orange-green when they

first appear, becoming bright chestnut-brown and very lustrous, in their first season, gray tinged with red the following year and ultimately ashy gray, and armed with slender straight or slightly curved bright chestnut-brown shining spines 3–4 cm. long.

Rocky pastures near Balance Rock, Lanesborough, Berkshire County, Massachusetts, *C. E. Faxon*, September 1899, *C. S. Sargent*, October, 1902, May 1904.

The relationship of this species is with the widely distributed *C. Holmesiana*, Ashe, from which it differs in its broad-ovate, not oval leaves, larger flowers and obovate later-ripening fruit.

Anomalae, Sarg. Rhodora, iii. 29 (1901).

Leaves cuneate, thickish to subcoriaceous, scabrate above while young; petioles slender, elongated. Flowers in many-flowered corymbs; anthers rose-colored or pink. Fruit short-oblong, orange-scarlet, 1–1.4 cm. in length; nutlets occasionally furnished with obscure ventral depressions. Mostly arborescent shrubs, all of western New England, eastern New York and the St. Lawrence valley near Montreal.

To this group, which is intermediate between the *Tomentosae* and the *Coccineae*, may be referred in addition to the following *C. asperifolia*, Sarg., *C. scabrida*, Sarg., *C. Brainerdi*, Sarg., and *C. Egglestoni*, Sarg.

Stamens 20.

Crataegus Seelyana, n. sp. Leaves obovate to oval, acuminate and often short-pointed at the apex, gradually narrowed and concave-cuneate at the entire base, finely doubly serrate above, with straight glandular teeth, and slightly divided above the middle into 4 or 5 pairs of short spreading acuminate lobes, when they unfold coated above with short white lustrous hairs and glabrous below, about half-grown when the flowers open at the end of May and then thin, yellow-green and slightly roughened above and pale below, and at maturity thick, glabrous, smooth and dark yellow-green on the upper, and pale or glaucous on the lower surface, 5–6.5 cm. long and 3.5–5 cm. wide, with stout yellow midribs, and slender veins extending obliquely to the points of the lobes; petioles slender, wing-margined at the apex, slightly grooved, glabrous, sparingly glandular, about 2 cm. in length; stipules linear, acuminate, glandular, bright rose color, caducous; leaves on vigorous shoots abruptly long-pointed, often rounded at the broad base, more deeply lobed, sometimes 6–7 cm. long and 4–5 cm. wide. Flowers 1.8 cm. in diameter, on slender

elongated glabrous pedicels, in usually 12–15-flowered corymbs, with linear-obovate to lanceolate glandular bracts and bractlets, bright rose color like the inner bud-scales and deciduous before the flowers open; calyx-tube narrowly obconic, glabrous, the lobes glandular-serrate usually only above the middle, or occasionally nearly entire, glabrous, reflexed after anthesis: stamens 20; anthers pale pink; styles 3, surrounded at the base by a narrow ring of pale tomentum. Fruit ripening at the end of September, on slender pedicels, in few-fruited clusters, short-oblong, lustrous, dull orange-red, about 1 cm. long and 7 cm. wide; calyx prominent, with a broad deep cavity, and appressed lobes mostly deciduous from the ripe fruit; flesh thin, yellow, dry and mealy; nutlets 3, rounded at the ends, slightly ridged on the back, with a broad low ridge, sometimes slightly hollow on the inner faces, 7–8 mm. long and 4–5 mm. wide.

An arborescent shrub 3–4 m. high, with ascending stems and stout nearly straight branchlets marked by small pale lenticels, deeply tinged with red and glabrous when they first appear, light chestnut-brown and very lustrous during their first winter and dark gray the following year, and armed with many stout nearly straight light chestnut-brown shining spines 2.5–5 cm. long.

Roadsides near Middlebury, Vermont, *Ezra Brainerd* (no. 6 A), May and September 1900, May 1901.

Formerly referred to *C. Brainerdi*, Sarg., but now distinguished from that species by the shape of the leaves, the color of the anthers the smaller fruits and by the more arborescent habit. It is named for Henry Martin Seely (1828–), for many years professor of chemistry and natural history in Middlebury College, teacher of botany and distinguished paleontologist.

Stamens 7–10.

Crataegus cyclophylla, n. sp. Leaves broadly ovate to suborbicular or rarely rhombic, short-pointed and acuminate at the apex, cuneate and entire at the base, sharply doubly serrate above, with straight or incurved glandular teeth, and slightly divided above the middle into 4 or 5 pairs of slender acuminate lobes, faintly tinged with red when they unfold, about half-grown when the flowers open the 1st of June and then thin, light yellow-green and somewhat roughened above by short white hairs and pale and glabrous below, and at maturity thick to subcoriaceous, dark yellow-green, lustrous, smooth or still slightly rough on the upper and pale on the lower surface, 5–6 cm. long and 4–5.5 cm. wide, with thick yellow midribs, and stout primary veins arching obliquely to the points of the lobes; petioles slender, slightly wing-margined at the apex, grooved on the upper

side, glabrous, glandular toward the apex, with minute deciduous glands, often rose color in the autumn, 2–2.5 cm. in length; stipules linear, acuminate, glandular, fading brown, caducous; leaves on vigorous shoots suborbicular to broad-obovate, coarsely serrate, only slightly lobed, subcoriaceous, often 6–7 cm. long and wide, with stout glandular petioles. Flowers 1.6–1.8 cm. in diameter, on slender glabrous pedicels, in compact usually 12–15-flowered corymbs, with linear glandular rose-colored bracts and bractlets; calyx-tube narrowly obconic, acuminate and red at the apex, glandular with minute dark red stipitate glands, reflexed after anthesis; stamens 7–10; anthers rose color; styles 3 or 4. Fruit ripening the end of September and persistent until winter, on slender reddish pedicels, in drooping few-fruited clusters, subglobose to short-oblong, orange-red, marked by small pale dots, 1.2–1.4 cm. long and about 1 cm. wide; calyx only slightly enlarged, with a wide deep cavity and spreading red lobes, their tips often deciduous from the ripe fruit; flesh thin, yellow, dry and mealy; nutlets 3 or 4, full and rounded at the ends, ridged on the back, with a high rounded ridge, 7–8 mm. long and 4–5 mm. wide.

An arborescent shrub 4–5 m. high, with ascending stems 5–7 cm. in diameter near the ground, and stout nearly straight branchlets marked by small oblong pale lenticels, light orange-green and glabrous when they first appear, light orange-brown and very lustrous during their first winter and dark gray-brown the following year, and armed with numerous stout nearly straight bright chestnut-brown and shining ultimately dull gray-brown spines 3–3.5 cm. long.

Roadsides, New Haven, Addison County, Vermont, *Ezra Brainerd* (no. 16a), June and September 1900, May 1901; *Brainerd* and *Sargent*, Sept. 1900.

The relationship of this species is with *C. Egglestoni*, Sarg., from which it differs in its much thicker semiorbicular leaves, larger flowers, glabrous corymbs and calyx-lobes, larger fruits and darker-colored nutlets, with dorsal ridges without grooves or only slightly grooved, and in the color of the branchlets and the length and color of the spines.

Crataegus Ideae, n. sp. Leaves, oval to ovate or obovate, short-pointed and acute at the apex, concave-cuneate and entire at the base, finely and occasionally doubly serrate above, with incurved conspicuously glandular teeth, and slightly divided above the middle into broad acute lobes, faintly tinged with red when they unfold, more than half grown when the flowers open at the end of May and then thin, light yellow-green and covered above by short white hairs and pale and glabrous below with the exception of a few axillary hairs, and at

maturity subcoriaceous, bright green, lustrous and sparingly hairy along the midribs on the upper and pale yellow-green and glabrous on the lower surface, 4–5 cm. long and 3.5–4 cm. wide, with stout yellow midribs rose-colored below toward the base, and slender prominent primary veins extending obliquely to the points of the lobes; petioles slender, narrowly wing-margined at the apex, grooved and villose on the upper side, glandular, with bright red mostly deciduous glands, rose-colored in the autumn, 1.5–2.5 cm. long; stipules oblong, acute, glandular, fading rose color, caducous; leaves on vigorous shoots broadly ovate, abruptly pointed or occasionally cuneate at the base, often 4 or 5 cm. long and 4 cm. wide. Flowers about 1.5 cm. in diameter, on elongated slender pedicels covered with long scattered white hairs, in wide lax many-flowered hairy corymbs, with oblong-obovate to linear bright rose-colored glandular bracts and bractlets mostly persistent until after the flowers have opened; calyx-tube narrowly obconic, glabrous or sparingly villose near the base, the lobes broad, gradually narrowed to the red glandular acuminate apex, obscurely serrate near the middle, glabrous on the outer, villose on the inner surface, reflexed after anthesis; stamens 10; anthers light pink; styles 3 or 4. Fruit ripening the middle of September, on stout slightly hairy erect red pedicels, in few-fruited clusters, short-oblong to subglobose, crimson, marked by large pale dots, about 1 cm. in diameter; calyx prominent, with a broad deep cavity and spreading lobes glandular-serrate above the middle, dark red and villose on the upper side, mostly persistent on the ripe fruit; flesh yellow, dry and mealy; nutlets 3 or 4, full and rounded at the ends, slightly ridged on the back, with a low narrow ridge, sometimes obscurely and irregularly pitted on the inner face, light-colored, about 7 mm. long and 4–5 mm. wide.

A tall much branched shrub forming wide thickets, with slender nearly straight branchlets marked by occasional large pale lenticels light yellow-green more or less tinged with red and nearly glabrous when they first appear, soon becoming bright chestnut-brown, dull reddish brown in their second and ashy gray in their third year, and armed with slender straight or slightly curved bright chestnut-brown shining spines 4.5–6 cm. long.

Hillside pastures at an altitude of about 500 metres, Concord, Essex County, Vermont; very abundant. *W. W. Eggleston* (nos. 3404, 3405 and 3405 A, type!), May and September 1903 and May 1905.

This species is named for Miss Mary Ellen Ide of the Fairbanks Botanical Museum, St. Johnsbury, Vermont.

COCCINEAE.

Stamens 10 or less.

Anthers white.

CRATAEGUS GRAVESII, Sarg. RHODORA, v. 160 (June 1903). An older name for this species is *C. Dodgei*, Ashe, *Jour. Elisha Mitchell Sci. Soc.* xix. 26 (March 1903). It is now known to range from Middlesex and Worcester Counties, Massachusetts (Shirley and Lancaster, *E. F. Thayer*) to western New York, and through Ontario to eastern Michigan, and to occur in eastern Pennsylvania.

Crataegus praetermissa, n. sp. Leaves broadly ovate to suborbicular or rarely oval, short-pointed and acuminate at the apex, broad, rounded or truncate or gradually narrowed and concave-cuneate at the glandular base, finely and often doubly serrate above, with straight gland-tipped teeth, and deeply divided into 4 or 5 pairs of slender acuminate lobes, more than half-grown when the flowers open the middle of May and then thin, yellow-green, lustrous and roughened above by short white hairs and paler and villose below especially along the midribs and veins, and at maturity thin but firm in texture, dark yellowish green, smooth and lustrous on the upper and pale and still villose on the lower surface along the slender yellow midribs, and thin veins arching obliquely to the points of the lobes, 5–6 cm. long and often as broad as long; petioles slender, slightly wing-margined at the apex, grooved on the upper side, glandular, with generally persistent glands, at first densely villose, becoming puberulous or nearly glabrous, 2–3 cm. in length. Flowers on short stout densely villose pedicels, in usually 5–7-flowered hairy corymbs; calyx-tube narrowly obconic, thickly coated with matted pale hairs, the lobes broad, acuminate, finely glandular-serrate, densely villose on the outer, sparingly villose on the inner surface, reflexed after anthesis; stamens 5–10; anthers white; styles 3 or 4. Fruit ripening about the middle of September and remaining on the branches until early in October, on long slender drooping sparingly hairy reddish pedicels, in few-fruited clusters, short-oblong to ovate, crimson, marked by small pale dots, hairy especially at the ends, 1–1.2 cm. long, 8–9 mm. in diameter, calyx little enlarged, with a wide deep cavity and spreading closely appressed villose lobes, their tips often deciduous from the ripe fruit; flesh thin, yellow, green, dry and mealy; nutlets 3 or usually 4, rounded at the base, gradually narrowed and rounded at the apex, only slightly ridged on the narrow back, about 7 mm. long and 4–5 mm. wide.

A shrub 2–3 m. high, with slender erect intricately branched stems, and very slender nearly straight branchlets marked by oblong pale lenticels, light green and thickly coated with matted pale hairs

when they first appear, soon glabrous and light bright chestnut-brown and very lustrous during their first year, becoming dull reddish brown the following season, and armed with slender straight chestnut-brown shining spines 3–5 cm. long.

Rocky borders of woods, eastern base of Marsh Hill, Ferrisburg, Addison County, Vermont, *Ezra Brainerd* (no. 17 b type!), August 1900, October 1901, 1903, *Brainerd and Sargent*, September 1905, *W. W. Eggleston* (no. 3338), May 1903.

Formerly referred to *C. coccinea*, Linnaeus, *C. praetermissa* differs from that species in its much thinner broader and more deeply lobed leaves and fewer-flowered corymbs, in its narrow pointed and only slightly ridged nutlets, and in its hairy fruit. It resembles *C. Faxoni*, Sarg., in the general shape of the leaves, but the leaves of *C. Faxoni* are much thicker, less deeply lobed and more hairy on the two surfaces while young, the pedicels are longer and soon glabrous, the fruit is larger, and the nutlets are longer, with more prominent dorsal ridges.

Anthers rose color or pink.

Crataegus propria, n. sp. Leaves ovate, acuminate, rounded or cuneate at the entire base, finely and often doubly serrate above, with incurved glandular teeth, and slightly divided above the middle into 4 or 5 pairs of broad acuminate spreading lobes, tinged with red when they unfold, about half grown when the flowers open the middle of May and then thin, yellow-green and covered above by short white lustrous hairs and pale and glabrous below, and at maturity thin and firm, glabrous, dark dull yellow-green on the upper, pale on the lower surface, 4–5 cm. long and 3–4 cm. wide, with slender yellow midribs sometimes tinged with red toward the base, and thin primary veins extending obliquely to the points of the lobes; petioles slender, wing-margined at the apex, slightly grooved, pubescent while young, soon becoming glabrous, glandular toward the apex, with minute dark stipitate glands; usually rose color in the autumn, 1.6–2 cm. in length; stipules linear, glandular, fading brown, caducous. Flowers on slender pedicels coated with matted pale hairs, in compact usually 9–12-flowered corymbs, with linear acuminate rose-colored bracts and bractlets; calyx-tube narrowly obconic, glabrous except at the base, the lobes slender, acuminate and red at the apex, glandular on the margins, glabrous on the outer, puberulous on the inner surface, reflexed after anthesis; stamens 5; anthers pale rose color; styles 2 or 3. Fruit ripening at the end of September and soon falling, on slender glabrous reddish pedicels, in small drooping few-fruited clusters, oblong, sometimes slightly ovate, full and rounded at the ends,

scarlet, lustrous, marked by small pale dots, 1–1.2 cm. long, 7–8 mm. wide; calyx prominent, with a narrow deep cavity, and reflexed closely appressed lobes pubescent on the upper side and often deciduous from the ripe fruit; flesh thick, orange color, becoming soft or succulent; nutlets usually 2, rounded at the ends or, when 3, acute at the apex, ridged on the back, with a high narrow ridge, about 7 mm. long and 5 mm. wide.

A shrub 3–5 m. high, with numerous stout ascending stems forming a broad round-topped head, and slender nearly straight branchlets marked by oblong pale lenticels, dark orange color and glabrous or slightly villose when they first appear, soon glabrous, bright chestnut-brown and lustrous during their first winter and dull gray-brown the following year, and armed with stout slightly curved bright chestnut-brown shining ultimately dull gray-brown spines 3–3.5 cm. long.

Low moist pastures, South Lancaster, Massachusetts, *E. I. Thayer* (no. 3, Parker Pasture, type!), September 1902, May and August 1903.

Crataegus Websteri, n. sp. Leaves oval, or sometimes oblong-obovate on vigorous shoots, acute or acuminate, gradually narrowed and concave-cuneate at the entire base, finely doubly serrate above, with straight glandular teeth, and slightly divided above the middle into 3 or 4 pairs of small spreading acuminate lobes, nearly fully grown when the flowers open late in May and then thin, light yellow-green and roughened above by short white hairs and pale and glabrous below with the exception of a few axillary hairs, and at maturity thin but firm in texture, dark yellow-green, nearly smooth on the upper and pale yellow-green on the lower surface, 5–6.5 cm. long and 3.5–4 cm. wide, with stout yellow midribs and slender conspicuous veins extending obliquely to the points of the lobes; petioles slender, slightly wing-margined at the apex, nearly terete, glandular, with minute stipitate mostly persistent glands, glabrous, 2–2.5 cm. in length. Flowers about 1.5 cm. in diameter, on long slender sparingly villose pedicels, in broad lax usually 8–14-flowered slightly hairy corymbs; calyx-tube narrowly obconic, slightly villose below the middle, glabrous above, the lobes gradually narrowed, acuminate, glandular serrate near the middle, glabrous on the outer and slightly hairy on the inner surface, reflexed after anthesis; stamens 7–10; anthers pale pink; styles 3, surrounded at the base by a narrow ring of white hairs. Fruit ripening the middle of September, on long drooping hairy pedicels, in few-fruited clusters, short-oblong, full and rounded at the ends, bright cherry red, lustrous, marked by large pale dots, 1–1.2 cm. long, 8–10 mm. wide; calyx enlarged, with a broad shallow cavity, and spreading slightly serrate lobes red and villose on the upper surface; flesh thin, yellow, dry and mealy; nutlets broad and rounded at the base, narrowed and rounded at the apex, ridged on the back, with a broad deeply grooved ridge, 6–7 mm. long and about 4 mm. wide.

An arborescent shrub 4–5 m. high, with a short trunk occasionally 15–18 cm. in diameter, spreading branches forming a wide open head, and stout zigzag branchlets marked by oblong pale lenticels, dark orange green and slightly hairy when they first appear, becoming pale chestnut brown and very lustrous, light reddish brown the following season, and ashy gray in their third year, and armed with very numerous slender nearly straight light chestnut-brown shining ultimately dull gray-brown spines 7–8 cm. long.

Hillsides, Holderness, Grafton County, New Hampshire, at elevations of from 250 to 300 m. above the sea, *L. S. Webster* (no. 6 type ! and 5), May and September 1903.

This species is named for its discoverer, Mr. Laurence J. Webster of Holderness.

Crataegus Lemingtonensis, n. sp. Leaves broadly ovate, acuminate, rounded or cuneate at the broad base, finely often doubly serrate above, with slender straight glandular teeth, and divided into 4 or 5 pairs of short narrow acuminate spreading lobes, about half grown when the flowers open during the last week in May and then thin, light yellow-green and roughened above by short white hairs and pale and glabrous below, and at maturity thin, glabrous, yellow-green and smooth on the upper, paler on the lower surface, 4–5 cm. long and wide, with thin yellow midribs, and slender primary veins arching obliquely to the points of the lobes; petioles slender, slightly wing-margined at the apex, glabrous, glandular, with minute scattered persistent glands, 2–3 cm. in length; stipules linear, glandular, fading rose color, caducous; leaves on vigorous shoots often truncate or subcordate at the broad base, coarsely serrate, more deeply divided into broad acuminate lobes, often 6 cm. long and wide. Flowers about 1.2 cm. in diameter, on elongated slender villose pedicels, in compact mostly 7- or 8-flowered hairy corymbs; calyx tube narrowly obconic, coated with long matted pale hairs, the lobes slender, acuminate, slightly glandular-serrate, villose, reflexed after anthesis; stamens 10; anthers pink; styles 3 or 4, surrounded at the base by a narrow ring of pale tomentum. Fruit ripening about the 10th of September, on slender drooping slightly villose pedicels, in few-fruited clusters, short-oblong, full and rounded at the ends, scarlet, lustrous, marked by occasional pale dots; calyx prominent, with a wide shallow cavity, and spreading or closely appressed lobes covered above with long white hairs, mostly persistent on the ripe fruit; flesh thick, yellow, soft and succulent; nutlets usually 3, gradually narrowed and rounded at the ends, ridged on the back, with a broad deeply grooved ridge, 6–7 mm. long and 4–5 mm. wide.

An arborescent shrub 4–5 m. high, with numerous ascending stems spreading into great thickets, and stout zigzag branchlets marked by

oblong pale lenticels, pale yellow-green and glabrous when they first appear, dull chestnut-brown during their first and light gray-brown in their second year, and armed with stout slightly curved chestnut-brown shining spines 4–5 cm. long and often pointed toward the base of the branch.

Hillsides, Essex County, Vermont; common; Lemington, Canaan, Bloomfield, *W. W. Eggleston* (no. 3408 type! Lemington); also the adjacent parts of New Hampshire.

Stamens 20; anthers pink.

Crataegus insolens, n. sp. Leaves oblong-ovate, acute or acuminate, gradually or abruptly cuneate or rounded at the base, finely often doubly serrate, with straight or incurved teeth tipped with bright red glands, and sharply and slightly divided into 4 or 5 pairs of slender acuminate lobes, deeply tinged with red and covered above when they unfold with soft white hairs and glabrous below, more than half grown when the flowers open during the last week of May and then thin but firm in texture, pale yellow-green, still hairy and slightly roughened above and pale or glaucous below, and at maturity thin, dark green and nearly smooth on the upper and pale yellow-green on the lower surface, 4–5 cm. long and 3–3.5 cm. wide, and on vigorous shoots 6–7 cm. long and 5–6 cm. wide, with slender yellow midribs, and thin primary veins extending obliquely to the points of the lobes; petioles slender, wing-margined at the apex, slightly grooved, glandular near the apex, with minute mostly early deciduous glands, glabrous, 2.5–3 cm. in length. Flowers on long slender slightly villose pedicels, in usually 7–10-flowered hairy corymbs, the lower peduncles from the axils of upper leaves, their bracts and bractlets linear, glandular, fading brown, caducous; calyx-tube narrowly obconic, glabrous, or villose at the base, the lobes gradually narrowed from wide bases, acuminate, irregularly glandular-dentate near the middle, glabrous on the outer, sparingly villose on the inner surface, reflexed after anthesis; stamens 20; anthers small, pink; styles 3–5. Fruit ripening the middle of September, on erect reddish pedicels, in 1–3-fruited clusters, short-oblong, rounded at the ends, scarlet, lustrous, 1–1.2 cm. long and 8–10 mm. wide; calyx little enlarged, with a broad shallow cavity, and spreading and reflexed lobes, their tips often deciduous from the ripe fruit; flesh thin, yellow-green, dry and hard; nutlets 3–5, rounded at the obtuse ends, or when more than 3 narrowed at the ends and acute at the apex, ridged on the back with a broad often deeply grooved ridge, about 7 mm. long and 4 mm. wide.

A shrub 3–4 m. high, with numerous stems spreading into broad thickets, and slender nearly straight branchlets marked by oblong

pale lenticels, orange-green more or less tinged with red and slightly hairy, with scattered pale hairs, when they first appear, soon glabrous, bright chestnut-brown and very lustrous during their first season and light reddish brown the following year, and armed with numerous straight or slightly curved bright chestnut-brown shining spines 3.5–5 cm. long.

Hillsides, West Concord, Essex County, Vermont, *W. W. Eggleston* (no. 3403 type!), May and September 1903.

Crataegus Blanchardi, n. sp. Leaves ovate, short-pointed and acuminate at the apex, abruptly or gradually narrowed and cuneate at the entire base, finely often doubly serrate above, with straight glandular teeth, and divided into 4 or 5 pairs of narrow acuminate lateral lobes, when they unfold bronze color, glandular at the base, and covered with long white hairs more abundant on the upper than on the lower surface, nearly half grown when the flowers open about the 20th of May and then thin, yellow-green above and paler and sparingly villose below along the midribs and veins, and at maturity subcoriaceous, dark green and lustrous on the upper and pale yellow-green and almost glabrous on the lower surface, 4.5–6 cm. long and 4.5–5 cm. wide, with stout yellow midribs and slender veins arching obliquely to the points of the lobes; petioles slender, wing-margined at the apex, slightly grooved, at first villose, becoming glabrous, and glandular, with minute mostly caducous glands; stipules linear, glandular, fading brown, caducous; leaves on vigorous shoots rounded or truncate at the base, coarsely serrate, deeply lobed, 6–7 cm. long and wide, with stout broadly winged petioles glandular through the season. Flowers 1.5–1.7 cm. in diameter, on long stout densely villose pedicels, in thick-branched hairy corymbs, with oblong to linear obovate glandular bracts and bractlets often persistent until the flowers open; calyx-tube broadly obconic, covered below with long matted pale hairs and glabrous above, the lobes gradually narrowed from wide bases, short, acuminate, glandular-serrate near the middle, glabrous on the outer, slightly villose on the inner surface, reflexed after anthesis; stamens 20; anthers pale pink, styles 3–5, surrounded at the base by a narrow ring of pale hairs. Fruit ripening at the end of September, on thick erect slightly villose pedicels, in few often 3–6-fruited clusters, short-oblong, full and rounded at the ends, dark cherry red, lustrous, marked by small pale dots; calyx little enlarged, with a wide shallow cavity, and spreading and appressed serrate lobes villose on the upper side and often deciduous from the ripe fruit; flesh thick, yellow, soft and pulpy; nutlets 3–5, rounded at the base, acute at the apex, ridged on the back, usually with a high narrow slightly grooved ridge, or when only 3 full and rounded at the ends, with a broad deeply grooved ridge, 6–7 mm. long and about 4 mm. wide.

A shrub 3–4 m. high, with numerous stems spreading into thickets,

and slender nearly straight branchlets marked by pale lenticels, dark orange-green when they first appear, light chestnut-brown and lustrous in their first winter, lighter-colored in their second season, and light gray-brown the following year, and armed with many stout slightly curved bright chestnut-brown shining ultimately dark gray-brown spines 4–5 cm. long.

Hillsides, Deerfield River Valley, Windham County, Vermont; common. Wilmington and Whitington, *W. H. Blanchard* (no. 7), August 1902, *W. W. Eggleston* (nos. 3451, 3452 type! and nos. 3446, 3449, 3453), May and September 1903.

This species is named for William Henry Blanchard, an industrious and critical student of Crataegus and Rubus, and the discoverer of other interesting New England plants.

Intricatae.

Crataegus Peckii, Sarg., Rhodora, v. 63, (1903). A specimen gathered at Great Barrington, Massachusetts, by *Brainerd* and *Sargent* on October 4, 1902, was doubtfully referred by me in Rhodora to this species. The flowers subsequently gathered by Mr. Eggleston showed that the Great Barrington shrub is *C. Baxteri*, Sarg., a common species in the neighborhood of Albany, New York, and in western New York and eastern Pennsylvania. *C. Baxteri* was published in June 1903 in the *Proceedings of the Rochester Academy of Science* (iv. 107) but the Pennsylvania plant had been published by Ashe as *C. foetida* in *Ann. Carnegie Museum* (i. pt. iii. 389) in May 1902, and his name must supercede *C. Baxteri*.

Arnold Arboretum.

A NEW RANUNCULUS FROM NORTHEASTERN AMERICA.

B. L. Robinson.

About a year ago the writer in examining some of the *Ranunculi* of the *pedatifidus-pygmaeus* affinity noticed that a plant from Labrador and Gaspé Peninsula of Quebec, which has been passing as

the arctic *R. pedatifidus* J. E. Smith, is in reality quite distinct from that species. The basal leaves are merely crenate as in *R. abortivus* L. and not deeply cleft as in *R. pedatifidus*. The smaller flowers and glabrous achenes furnish also clear characters for the separation of the northeastern plant. An attempt to place more satisfactorily this little buttercup led at that time to the view that it was a tall variety of the arctic *R. pygmaeus* Wahl.

During the past summer, however, Messrs. Fernald & Collins in their exploration of Gaspé Peninsula succeeded in securing an abundance of fruiting and some flowering material both of the typical *R. pygmaeus* and of the doubtful plant. From their field observations they were convinced that the two were entirely distinct, and they have kindly referred their specimens to the writer for further study. The doubtful plant, as shown by the excellent material now at hand, proves in fact readily distinguishable both from *R. pedatifidus* and from *R. pygmaeus*, differing from the latter not merely by greater stature and more erect habit but by having much larger achenes. The species is dedicated with pleasure to Mr. John Alpheus Allen, who early collected it on Mt. Albert, Gaspé. It may be characterized as follows: —

Ranunculus Allenii, NOV. SPEC. Herba perennis terrestris parva erecta caulescens 1.2–2 dm. alta; radice e fibris gracilibus plurimis composita; caule solitario simplici vel semel ramoso erecto gracili leviter villoso recto vel plus minusve flexuoso viridi 2–4-foliato; foliis radicalibus ca. 4 longe petiolatis orbicularibus vel subreniformibus 8–20 mm. longis 15–30 mm. latis profunde 7–11-crenatis ciliatis utrinque viridibus subtus vix pallidioribus, petiolis gracilibus villosis 3–7 cm. longis; foliis caulinis in lobos ellipticos vel lanceolati-oblongos fere ad basin 3–5-sectis, petiolis brevibus; foliis supremis subsessilibus saepissime integris lanceolatis vel 2–3-partitis; pedunculis villosis 1–6 cm. longis; sepalis 5 ovatis obtusis subpetaloideis luteo-vel viridi-purpurascentibus venosis pallide villosis concavis 3 mm. longis patentibus vel plus minusve reflexis; petalis 5 laete flavis obovato-suborbicularibus integris 5 mm. longis 3–3.5 mm. latis, nectariis saturate flavis obtriangularibus truncatis vel levissime retusis; staminibus 12–20, filamentis clavellatis glabris; stylis filiformibus recurvatis, parte basali in rostro parvo uncinato persistente; achaeniis semiobovatis leviter compressis viridibus glabris 1.8 mm. longis; receptaculo ovoideo-cylindrico patente villoso.

Herbaceous, perennial, terrestrial, small, erect, caulescent, 1.2 to 2 dm. high: root a fascicle of slender fibers; stem solitary, simple or once branched, slender, slightly villous, straight or somewhat flexuous, green, 2–4-leaved: basal leaves about 4, long-petioled;

limb orbicular or somewhat reniform 8 to 20 mm. long, 15 to 20 mm. wide, deeply 7–11-crenate, ciliate, green on both surfaces, scarcely paler beneath; petioles slender 3 to 7 cm. long; cauline leaves cleft almost to the base into 3 to 5 elliptical or lanceolate-oblong lobes; their petioles short; the uppermost leaves subsessile, entire and lanceolate or 2–3-parted: peduncles villous, 1 to 6 cm. long: sepals 5, ovate, obtuse, somewhat petal-like yellowish or greenish purple, veiny, pale, villous, concave, 3 mm. long, spreading or slightly reflexed: petals 5, bright yellow obovate-suborbicular, entire, 5 mm. long, 3 to 3.5 mm. wide; nectaries deep yellow, reversed triangular, truncate or retuse: stamens 12 to 20; filaments clavellate, glabrous: styles filiform, recurved, the basal part persistent as a short hooked beak; achenes semi-obovate, slightly compressed, green, glabrous, 1.8 mm. long: receptacle ovoid-cylindrical, spreading-villous.

Gaspé County, Quebec: on flood plain of an alpine brook, north face of Mt. Albert, alt. 770 to 1100 m., 14 August, 1905, *J. F. Collins & M. L. Fernald*, no. 83 (type, in herb. Gray); by a rivulet on the side of Mt. Albert, alt. 550 m., 23 July, 1881, *J. A. Allen*. Labrador: Okkak, collected by the Moravian Brothers, the specimen confused with plants of *R. pygmaeus* Wahl.; Rama, 20–24 August, 1897, *J. D. Sornborger*, no. 189.

So far as traced by the writer the plant, here described as *R. Allenii*, has been in the past treated as follows:—

R. affinis var. *leiocarpus* J. Macoun, Cat. Pl. Canad. 18 (1883).

R. affinis Robinson in Gray, Syn. Fl. i. pt. 1, 31, in foot-note (1895), not R. Br.

R. pedatifidus Britton & Brown, Ill. Fl. ii. 77 (1897), as to plant of Quebec and Labrador, as to most of the characters given, and as to the habital sketch, but not, however, as to the achene figured, which from its pubescence is presumably that of *R. pedatifidus* J. E. Smith.

By the distinctions already given *R. Allenii* can be readily separated from *R. pedatifidus* and from the typical form of *R. affinis*. Regarding *R. affinis*, var. *leiocarpus* Trautv., the difficulty is greater, owing to the extremely meager and unsatisfactory description of the Siberian plants. Trautvetter distinguishes his variety solely on its smooth achenes and in this character it would accord well enough with the plant of northeastern America, but he further divides the variety into two forms, the first with petals twice longer than the suborbicular sepals and the second with petals somewhat shorter than the oblong-elliptical sepals. Neither of these brief character-

izations fits satisfactorily the American plant, which has as we have seen, ovate sepals about two-thirds the length of the petals. It is more than probable that the elements included by Trautvetter in his var. *leiocarpus* were quite different from each other, if not specifically distinct. When to this fact is added his vague and fragmentary characterization and the great geographic distance of the Siberian station, the treatment of the American plant as a separate species seems to be fully justified.

R. Allenii possesses a curious and interesting habital resemblance to the plant of southern Missouri and adjacent Arkansas, which was described as *R. abortivus*, var. *Harveyi* Gray, Proc. Am. Acad. xxi. 372 (1886), and which has since been raised to specific rank by Dr. Britton. The northeastern plant has, however, a decidedly lower stature and rounder petals. The marked difference of geographic range and habitat would furthermore render specific identity extremely improbable.

Gray Herbarium.

PHYCOLOGICAL NOTES OF THE LATE ISAAC HOLDEN, — II.

Edited by F. S. Collins.

(*Continued from p. 172.*)

Lyngbya subtilis Holden. 774, 779. Seaside Park. Dec. "This appears to have filaments attached at the middle. Can find no terminal hairs. Has it any chroococcoid stratum except the *Pleurocapsa* with which it is associated and upon which it appears to be epiphytic? Escaped hormogonia U-shaped. Branching?."

L. lutea (Ag.) Gomont. 939, 1060, 1473, 1501, 1507. On woodwork between tide marks, below Yellow Mill Bridge; on turfy bottom at Seaside Park; among *L. aestuarii* (Mert.) Liebm., Cook's Point; on sandy mud, Charles Island. May–July, Oct.

Symploca hydnoides Kütz. 862. With other minute algae in Yellow Mill Pond. Aug.

Plectonema terebrans Born. & Flah. 861, 869. In marine shells with other algae, Harbor. Sept., Oct.

Hydrocoleum glutinosum (Ag.) Gomont. 664 = P. B.–A. 453, 1033. On iron piles, Black Rock Beacon. July, Aug.

H. Holdenii Tilden. 1194, 1195, 1326, 1367 = P. B.–A. 602, 1464. "Forming a gelatinous tubular coating around old stems of Spartina in a brackish ditch." Cook's Point. May, Sept.

Microcoleus chthonoplastes (Fl. Dan.) Thuret. 881, 1508. Seaside Park, forming a thick coating on turf near high water mark; Cook's Point, in sheets, on sandy bottom between tide marks. Sept., Oct.

Anabaena torulosa (Carm.) Lagerh. 339, 1119. On mud on margin of marsh pools, Cook's Point; on muddy sand, near high water mark, among *Spartina*, shore of The Gut. June.

A. variabilis Kütz. 704, 709. With *Oscillatoria princeps* Vauch, etc., Fresh Pond. Aug.

Nodularia spumigena var. *major* (Kütz.) Born. & Flah. 1458, 1459, 1460, 1461. Marsh pool, Cook's Point, filaments scattered among *Lyngbya*, *Hydrocoleum*, etc., May 14. "No spores observed." May 20. "No spores yet." May 28. "Spores have appeared, proving var. γ *major* Bornet & Flahault."

Microchaete grisea Thuret. 765. On stranded stump, Seaside Park. Nov.

Mastigocoleus testarum Lagerh. 709½, 861. In shells, Fresh Pond. Aug., Sept.

Amphithrix violacea (Kütz.) Born. & Flah. 756. On stones, Fresh Pond. Nov.

Calothrix aeruginea (Kütz.) Thuret. 732½, 1034. Forming a coating with *Enteromorpha sp.* on iron piles between tide marks, Black Rock Beacon. Aug., Oct.

C. confervicola (Roth) Ag. 703. On *Ruppia*, Fresh Pond. Aug.

C. crustacea Thuret. 155, 482, 483, 636 = P. B.–A. 10, 641, 714, 724. On algae and rocks, Stratford Shoals; Woodmont; Cook's Point. July, Sept., Oct.

C. parasitica (Chauvin) Thuret. 1127a. On *Nemalion multifidum*, Stratford Shoals. July.

C. pulvinata (Mert.) Ag. 147, 487, 967. On woodwork at or above high water mark, Black Rock; Stratford Shoals; on old hulk, Cook's Point. Aug., Oct.

C. scopulorum (Web. & Mohr) Ag. 153, 1128. On rocks, Stratford Shoals. July, Sept.

Rivularia atra Roth. 1220 = P. B.–A. 357b. On turf of *Spartina*, Charles Island. Sept.

R. nitida Ag. 651, 685, 728. On bank of outlet, Fresh Pond. July–Sept.

Isactis plana (Harv.) Thuret. 439, 726. On stones, Charles Island. Sept.

Monostroma crepidinum Farlow. 761, 763, 772, 1066. Seaside Park, on rocks; outlet of Fresh Pond. Nov., Dec.

M. Grevillei (Thuret) Wittr. 268, 279, 557, 794, 797, 801. Seaside Park; Cook's Point. March, Apr.

M. latissimum (Kütz.) Wittr. 14, 18, 310, 321, 333, 1244, 1353, 1356, 1456. Fresh Pond, on *Zostera*, *Ruppia*, etc. "Fronds of all sizes up to nearly 2 ft. long, some over a foot wide, some small ones looking like *M. pulchrum*." Cook's Point; Yellow Mill Pond. Apr., May.

Ulva Lactuca var. *rigida* (Ag.) Le Jolis. 1339, 1349 = P. B.–A. 407. On stones in pools and between tides, Seaside Park. Nov.

U. Lactuca var. *mesenteriformis* (Roth) Collins. 1354, 1355. Washed ashore, Yellow Mill Pond. Apr.

Enteromorpha clathrata (Roth) J. Ag. 1269. Fresh Pond. June.

E. crinita (Roth) J. Ag. X5, X10, X11. On turf near high water mark, Seaside Park; Fresh Pond.

E. erecta (Lyng.) J. Ag. 612. On *Fucus*, Woodmont. June.

E. Hopkirkii McCalla. 692, 719, 804, 806 = P. B.–A. 463. On *Zostera*, Milford Point; Fresh Pond. Apr., Sept. "At Fresh Pond in April this grew to the length of 2 or 3 feet in a week, forming long, ropy, confervoid strings, attached at base to pebbles (and shells) and floating on the surface. The long, monosiphonous branches and elongated tips, when fresh, float in the air like spider's webs."

E. intestinalis (L.) Link. 282, 311, 336, 950. Fresh Pond; Yellow Mill Pond. Mar.–June.

E. intestinalis forma *cylindracea* J. Ag. X7, X9, 1257. Seaside Park; Yellow Mill Pond. May.

E. Linza (L.) J. Ag. 316, 330, 821, 1359. Seaside Park. Apr., May.

E. Linza var. *crispata* J. Ag. X1. Brackish pond in Seaside Park. Apr.

E. minima Näg. 782, 808, X3, X8, 1245, 1255 = P. B.–A. 468, 1256, 1261. On stones and mussels near high water mark, below Yellow Mill Bridge; Seaside Park. Feb., May.

E. percursa (Ag.) J. Ag. 1260. Cook's Point, among other algae. May.

E. prolifera J. Ag. 823, 829, 1254 = P. B.–A. 470, 1258, 1264. Yellow Mill Pond, "Some specimens 6 or 7 feet long"; Seaside Park, on stones and shells; Fresh Pond, attached to firm sandy bottom and *Spartina* turf between tide marks; Cook's Point. May.

Ilea fulvescens (Ag.) J. Ag. 33, 379, 687, 767, 755, 777, 1196. On rocks between tides, Seaside Park; on timber at shipyard, Cook's Point; Fresh Pond; Long Beach. May, June, Oct.–Dec.

Protoderma marinum Reinke. 1483a. Seaside Park. Jan.

Ulothrix flacca (Dillw.) Thuret. 558, 912, 915, 1077, 1079. With *U. implexa*, on rocks not far from high water, Woodmont; on *Fucus*, Seaside Park. Mar., Apr.

U. implexa Kütz. 558, 792, 793, 799, 810 = P. B.–A., 115a, 815, 1172. Woodmont, with *U. flacca*; on stones and *Spartina*, Yellow Mill Pond; in brackish pond, Seaside Park. Dec., Apr., May.

Stichococcus marinus (Wille) Hazen. (*Ulothrix variabilis* var. *marina* Wille.) 1093. Ash Creek, near Black Rock, on bank overflowed at high water. Apr.

Epicladia Flustrae Reinke. 610, 691, 864. On polyzoon on back and legs of spider crab. June, Aug.

Hormiscia penicilliformis (Roth) Fries. (*Urospora penicilliformis* Aresch.) 232, 240, 256, 280, 309, 543, 555. On rocks and woodwork, near high water mark, Seaside Park; Cook's Point. Jan.–Apr., Dec.

Chaetomorpha aerea (Dillw.) Kütz. 27. On pebbles, Long Beach. June.

C. Linum (Fl. Dan.) Kütz. 688 = P. B.–A. 22, 1432. Long Beach, near Stratford Point; Salt marsh pool, Cook's Point. Aug., Oct.

Rhizoclonium riparium (Roth) Harv. 151. On rocks between tides, Stratford Shoals. Sept.

R. tortuosum Kütz. 1235, 1236. Forming a fleece on *Sphacelaria radicans*, etc., Seaside Park. Dec.

R. tortuosum forma *polyrhizum* Holden. 1266 = P. B.–A. 625. On firm bottom and on other algae, Cook's Point. June.

Cladophora albida (Huds.) Kütz. 34, 609. On stones near low water mark, Seaside Park. June.

C. albida var. *refracta* Thuret. 943, 1129, 1546. Cook's Point; Stratford Shoal; The Gut. May–July.

C. arcta (Dillw.) Kütz. 245, 266, 298, 308, 314, 785, 914, 1074. Seaside Park. Jan., Mar.–May.

C. expansa (Mert.) Kütz. 796, 830 = P. B.–A. 121. Brackish pond, Cook's Point. Apr., May. "Lives through the winter."

C. expansa forma *glomerata* Thuret. 1536. Fresh Pond. Aug.

C. gracilis (Griff.) Kütz. 46, 351, 356, 364, 848, 1374. Cook's Point, in muddy pools; Woodmont; Charles Island. June, July.

C. lanosa (Roth) Kütz. 1498. Charles Island, floating. May.

C. lanosa var. *uncialis* (Harv.) Thuret. 37. Stratford Shoal. June.

C. Magdalenae Harv. 1440. Charles Island. Nov. "Forming felty mats or turfs on sandy mud, among *Spartina*, near high water mark. Same grows on shore of Seaside Park. A cold weather plant, appearing in late autumn (as far as I know)." "Dec. 25. Cladophora No. 1440 was fairly abundant at this time."

C. Rudolphiana (Ag.) Harv. 12, 19, 148, 322, 331, 594. Fresh Pond, abundant on stones, *Ruppia*, etc. May, Sept.

Gomontia polyrhiza (Lagerh.) Bornet & Flahault. 861. In dead shells, Bridgeport harbor. Aug.

Bryopsis plumosa (Huds.) Ag. 57, 383, 624, 649, 675, 847, 1373. Penfield Reef; Breakwater; Seaside Park; Woodmont; Pool about high water mark, Charles Island. June–Aug.

Vaucheria litorea Ag. 1173, 1177, 1351. Abundant in very brackish pond, Seaside Park. Apr., Dec.

V. piloboloides Thuret. 663, 722, 1200. On muddy rocks below low water, Black Rock Beacon, July; "On shelly sand bottom near westerly extremity of sand bar running into harbor from near Pleasure Beach House, Alcazar, just below ordinary low water mark, in abundant tufts over several square rods." Sept.

Pylaiella littoralis (L.) Kjellm. 1447. Cook's Point. Unilocular sporangia, Apr.

Ectocarpus aecidioides Rosenv. 1497. On tips of *Laminaria Agardhii*, Charles Island. May.

E. amphibius Harv.? 332. On *Zostera*, and *Ruppia* Fresh Pond. May.

E. confervoides (Roth) LeJolis. 534, 539, 762, 765. Seaside Park, on *Fucus*, etc. Dec. "No. 762 on stranded stump; cells in largest filaments 20–30 μ, as long as wide; in ultimate branches about 12 μ, several times longer than wide. Plurilocular sporangia 18–30 μ wide, 75–125 μ long; branching alternate."

E. confervoides forma *brumalis* Holden. 542, 548, 1442 = P. B.–A. 576. On *Spartina*, stubble, etc., between tides, nearer high water mark, Seaside Park and Charles Island. Dec., Jan. "Extreme breadth of cells about 25 μ; plurilocular sporangia of various lengths up to 150 μ or more, and in width up to 25 μ; fronds mostly one or two cm. in height. I have never seen this form except in winter, mostly about Xmas time."

E. reptans Crouan? 650. On *Zostera*, Black Rock. July.

E. siliculosus (Dillw.) Ag. 1032, 1262, 1341. Black Rock Beacon; Fresh Pond; Cook's Point. May, Aug., Nov.

E. subcorymbosus Farlow.[1] 703, 720, 1230, 1340 = P. B.–A. 415. On *Ruppia*, with *Enteromorpha*, etc., Fresh Pond; in muddy pools, Cook's Point. Aug.–Nov. "About 1 mm. high; cells about 12 μ or a little more in diameter, 2–4 times as long. Branching alternate or opposite. When opposite the main filament often prolonged into a very long hyaline hair from the point of branching. Such a hair also frequently taking the place of a branch or forming the prolongation of an ordinary filament or branch. Plurilocular sporangia 18–25 μ wide, 60–100 μ long, terminal or lateral, the latter generally with a short stipe of 1–3 cells. Filaments much crowded at base, where they (and also hairs) spring from an almost parenchymatous mass."

Ascocyclus orbicularis (J. Ag.) Magnus. 874, 1521. On *Zostera* Yellow Mill Pond; Pleasure Beach. July, Sept.

Sphacelaria radicans (Dillw.) Ag. 149, 177, 880. Stratford Shoal, on rocks between tides; Seaside Park, on turfy bottom. Sept.–Nov.

S. cirrhosa (Roth) Ag. 510, 535. Seaside Park, on *Fucus* and *Polysiphonia*. Nov., Dec.

Desmotrichum undulatum (J. Ag.) Reinke. 575, 1100, 1104, 1252. Seaside Park, on *Zostera*, with *Halothrix*. Apr., May. Plurilocular sporangia, May.

D. Balticum Kütz. With *D. undulatum*, Seaside Park, with plurilocular sporangia, May.

Punctaria latifolia Grev. 812, 930, 931 = P. B.–A. 82, 936, 1111, 1192, 1248, 1250. Cook's Point; Seaside Park; on shells and *Zostera*. Apr., May.

[1] This quite distinct species has long been in the unsatisfactory position of a species distributed under a manuscript name but never published. Mr. Holden's excellent description may well be used to place it on a more stable basis.— F. S. C.

P. plantaginea (Roth) Grev. 817, 922, 928, 935 = P. B.–A. 81, 1073, 1089, 1105, 1237, 1247. Seaside Park, on stones and *Fucus*, just below low water. Apr., May.

Scytosiphon lomentarius (Lyng.) J. Ag. 819, 918, 1072, 1088, 1246 = P. B.–A. 323a. Seaside Park, on stones. Apr., May.

S. lomentarius forma *complanatus* Rosenv. 917, 1080, 1085, 1087 = P. B.–A. 174, 1176, 1178, 1238, 1243, 1489, 1509. Seaside Park, on *Zostera*. Mar., Apr. "May 5, The narrow compressed *Scytosiphon* (1087, 1095, etc.) becoming passé. Occasional old fronds of it floating on the surface, inflated."

Phyllitis fascia (Fl. Dan.) Kütz. 230, 537, 546, 547, 758, 802, 813, 929, 1068, 1090, 1272, 1344. Seaside Park; Cook's Point; on stones, mussels, and *Spartina* stumps. Nov.–June.

P. fascia var. *caespitosa* (Ag.) Farlow. 293, 294, 302, 305, 896. With the type. Apr., Nov.

Asperococcus echinatus (Mert.) Grev. 1253. Diminutive form growing on *Zostera* with *Desmotrichum*, *Halothrix*, etc. Seaside Park. May.

Stictyosiphon subsimplex Holden. 1342, 1365, 1366, 1368, 1462, 1465 = P. B.–A. 630. Cook's Point, in muddy marshy pools. Nov., May, June. "Noted fronds of lengths up to 5½ inches."

Desmarestia aculeata (L.) Lamour. 1491. Seaside Park. Apr.

D. viridis (Fl. Dan.) Lamour. 295, 299, 306, 313, 323, 568, 573, 783, 911, 916, 921, 923, 926, 927, 1084, 1094, 1098, 1179, 1180, 1239, 1240, 1350, 1362, 1484. Seaside Park. March–May.

Dictyosiphon fœniculaceus var. *Americanus* Collins. 304, 312, 814, 820, 937, 1114, 1496, 1506. On *Phyllitis* and *Scytosiphon*; Cook's Point, in marsh pools; Seaside Park; Black Rock. Apr.–June.

Elachista fucicola (Velley) Fries. 38, 586. Stratford Shoal; Seaside Park. May, June.

Hilothrix lumbricalis (Kütz.) Reinke. 315, 328, 533, 569, 587, 1096, 1103, 1251. Seaside Park, on *Zostera*. Dec., Apr., May.

Castagnea virescens (Carm.) Thuret. 1101. On *Zostera*, Seaside Park. May.

Myriactis pulvinata var. *minor* Farlow. 865. On *Sargassum*, Seaside Park. Aug. "Apparently rather young. Only plurilocular sporangia; filaments up to 25 μ broad, but generally 10–18 μ."

Leathesia difformis (L.) Aresch. 320, 327, 1112, 1116, 1502. On *Zostera*, Seaside Park; Cook's Point; Charles Island. May.

Mesogloia divaricata (Ag.) Kütz. 846, 867, 1143. Woodmont, on *Chondrus*; Seaside Park; Long Beach. July, Aug.

Chordaria flagelliformis (Fl. Dan.) Ag. 382, 422, 1106, 1113. On stones below low water, Long Beach; on *Zostera*, young, Seaside Park. May–Aug.

Stilophora rhizodes (Ehrh.) J. Ag. 419, 420, 644, 693, 1407. Attached to pebbles on sandy flats about low water mark or a little below; Long Beach; Black Rock; Milford; Charles Island. July, Aug.

S. rhizodes forma *contorta* Holden. 627, 1263, 1270. Fresh Pond. May, July. "Fronds contorted and entangled in dense bunches on stones in shallow water, about one foot deep."

Ralfsia Borneti Kuckuck. 1483b. Seaside Park. Jan.

R. clavata (Carm.) Farlow. 1510. On stones in pools, Charles Island. Apr.

R. verrucosa (Aresch.) J. Ag. 444, 484, 593, 678, 1224=P. B.–A. 325b.

Chorda Filum (L.) Stack. 647. Black Rock, young. July.

Laminaria Agardhii Kjellm. (*L. saccharina*, in part.) 489, 780, 1041, 1369, 1377, 1443, 1445, 1448, 1449, 1487, 1490, 1492, 1493, 1504, 1544, 1549, 1553. Washed ashore, Seaside Park; The Gut; Black Rock; Charles Island; Pleasure Beach; dredged, Stratford Shoal. Jan., Mar.–June, Oct. Fruit, Oct. "1449, Apr. 22, Old and new blade."

L. Agardhii forma *vittata* Setchell. 1467. Black Rock Beacon. June. "1518. June 30. Dredged from a depth of 2 or 3 fathoms at low water."

Fucus evanescens Ag. 297, 303, 592, 789, 805. 1078, 1086, 1091, 1370, 1488. Seaside Park; Woodmont; Apr.–June.

F. platycarpus Thuret. 157, 480, 490, 1380. Rocks about low water mark, Stratford Shoal; Woodmont; Cook's Point. June, Sept. Oct.

F. platycarpus forma. 1423, 1537. Woodmont. Sept. A form intermediate between the typical one and *F. Areschougii* Kjellman.

F. vesiculosus L. 1115, 1118, 1371. Long Beach; Seaside Park. June.

F. vesiculosus var. *spiralis* (L.) Ag. 1378, 1379=P. B.–A. 680. Chippy Island, near The Gut. June. "Growing unattached, in tangled bunches, along with *Ascophyllum Mackaii*, the latter in dense

beds, finely dissected, sterile. On grassy bottom above limit of ordinary high water, rarely producing little vesicles and attempts at fruiting. A beautiful plant when growing. It has very much the habit of *Ascophyllum Mackaii* and seems to bear the same relation to typical *F. vesiculosus* as *A. Mackaii* does to *A. nodosum*."

F. vesiculosus var. *sphaerocarpus* Farlow. 1372. Cook's Point. June.

F. vesiculosus var. *laterifructus* Grev. 679, 715, 764. Woodmont. Aug., Sept., Nov. "Resembles *F. ceranoides*."

F. vesiculosus forma? 1363, 1364. Cook's Point, on mussels near high water mark, in thick beds. "When young this appears to be a good var. *spiralis*; older it develops oftentimes abnormal vesicles; rarely fruiting." May.

Ascophyllum Mackaii (Turn.) Holmes & Batters. 281, 305a, 1082, 1097 = P. B.–A. 177. Mar.–May.

A. nodosum (L.) LeJolis. 800, 1455, 1457 = P. B.–A. XV. Seaside Park; Fairweather Island. Apr., May. "No. 800, hermaphrodite, young oogonia in same conceptacles with antheridia; oogonia comparatively few, on the same branched hairs as the antheridia; also sometimes arising in the regular way from the interior wall of the conceptacle."

Sargassum Filipendula Ag. 855, 1416, 1421, 1441. So. Norwalk; Seaside Park; on stones along the bar, Charles Island. Aug., Sept., Nov.

S. Filipendula forma *subedentatum* J. Ag. 1325, 1421. Sept. With the type.

Goniotrichum elegans (Chauv.) LeJolis. 179, 496, 497. Among *Sphacelaria radicans*, Seaside Park. Oct., Nov.

G. ramosum (Thwaites) Hauck. 1169. On *Ruppia*, among various small algae, Fresh Pond. Nov.

Bangia ciliaris Carm. 496, 507, 511, 532, 878, 888 = P. B.–A. 88, 889, 895. On *Zostera*, *Fucus vesiculosus*, *Sphacelaria cirrhosa*, etc., in company with *Goniotrichum*, *Erythrotrichia*, etc. Oct.–Dec. "We examined No. 887 this evening, and found numerous filaments fruiting. A cell forms a number of spores which escape from a lateral protuberance. The spores frequently lodge and germinate on filaments of the *Bangia*, giving it the appearance of branching."

B. fuscopurpurea (Dillw.) Lyng. 892, 894 = P. B.–A. 87b, 900, 901. On rocks and woodwork, near high water mark, Yellow Mill Bridge; Sea wall, Seaside Park. Nov., Dec.

Porphyra laciniata (Lightf.) Ag. 788, 1441b. On rocks, Seaside Park. Mar. Young plants, Nov.

P. leucosticta Thuret. 781, 784, 787, 791, 798, 1071, 1081, 1083, 1242 = P. B.–A. 376. On *Fucus*, rarely on stones, Seaside Park; Cook's Point. Jan.–Apr.

Erythrotrichia ceramicola (Lyng.) Aresch. 496, 725. With other algae on *Zostera* and *Fucus*, Seaside Park; Charles Island. Sept., Oct.

Acrochaetium Sagraeanum (Mont.) Bornet. (*Chantransia virgatula*, in part.) 17, 646, 701 = P. B.–A. 39, 708, 750, 757. On *Ruppia*, Fresh Pond. May, July–Nov.

Nemalion multifidum (Web. & Mohr) J. Ag. 1127. On rocks near low water mark, Stratford Shoal. July.

Gelidium crinale (Turn.) J. Ag. 712, 1539. Woodmont; Seaside Park. Sept.

Chondrus crispus (L.) Stack. 564, 1335. Woodmont. Cystocarps, Apr., Oct.

Phyllophora membranifolia (Good. & Woodw.) J. Ag. 1043, 1324, 1329, 1331, 1334 = P. B.–A. 379a, 1530. Dredged, Stratford Shoal; Penfield Reef; washed ashore, Woodmont. Aug.–Oct. Cystocarps, Sept., Oct.

P. Brodiaei (Turn.) J. Ag. 1042, 1330, 1332. Dredged, Stratford Shoal; Penfield Reef. Oct.

P. Traillii Holmes. 713. Sides of rocks, between tide marks, Woodmont. Sept.

Ahnfeltia plicata (Turn.) Fries. 26. Long Beach. June.

Sterrocolax decipiens Schmitz. On *Ahnfeltia*, No. 26.

Actinococcus subcutaneus (Lyng.) Schmitz. On *Phyllophora Brodiaei*, No. 1042.

Agardhiella tenera (J. Ag.) Schmitz. 176, 425, 434, 475, 493, 721, 759, 868, 962, 965, 972, 1029, 1148, 1338, 1410, 1411 = P. B.–A. 138, 1419. Seaside Park; Pleasure Beach; Cook's Point. July–Nov. Tetraspores, Aug., Sept., Nov.

Gracilaria multipartita (Clem.) Ag. 73, 423, 426, 682, 727, 852, 859, 875, 1037, 1478, 1479 = P. B.–A. 634, 1535. Seaside Park; Cook's Point; Fresh Pond; The Gut. July–Sept. Tetraspores, July. Var. *angustissima* Harv. much commoner than type.

Rhodymenia palmata (L.) Grev. 566, 1222, Woodmont; Long Beach. Apr., Nov.

Lomentaria uncinata Menegh. 400, 416, 430, 435, 442, 474, 695. Seaside Park; Stratford Point; Long Beach; Milford Point. Aug., Sept.

Champia parvula (Ag.) Harv. 436, 681, 856. Woodmont; Norwalk; Bridgeport harbor. Aug., Sept. Cystocarps, Aug.

Grinnellia Americana (Ag.) Harv. 55, 73, 370, 384, 387, 395, 398, 402, 404, 414, 427, 433, 623, 633, 653, 851, 854, 960, 963, 971, 1146, 1206, 1328, 1382 = P. B.–A. 593a, 1383, 1384 = P. B.–A. 593b, 1386, 1388, 1390, 1392, 1394, 1396, 1399, 1403, 1409, 1472, 1520, 1532, 1547. Floating, Seaside Park; Cook's Point; Pleasure Beach; On oyster shells and stones in The Gut. July–Sept. Cystocarps, tetrapores and antheridia, July. "May 9, Searched for Grinnellia but found none." "July, Young plants on Ascophyllum." "July 10, Floating very early in the season." "Aug. 10, No. 1409, old fronds with proliferations." "Aug. 25, No. 1532, old fronds covered with young plants from germinating spores."

Caloglossa Leprieurii (Mont.) J. Ag. 170, 171, 172, 175, 181, 545. Cook's Point. Oct., Nov., Jan. (See note under *Bostrychia rivularis*.)

Chondria tenuissima (Good. & Woodw.) Ag. 381, 418, 421, 857, 1136, 1142, 1401. On stones just below low water mark, Long Beach; So. Norwalk. July, Aug.

C. Baileyana Harv. 403, 406, 1028. On stones just below low water mark, The Gut. Aug.

Polysiphonia elongata (Huds.) Harv. 919. Seaside Park. Mar.

P. fastigiata (Roth) Grev. 479. On *Ascophyllum nodosum*. Woodmont. Oct.

P. Harveyi Bailey. 1534 = P. B.–A. 888. Charles Island. Aug. "On *Zostera*, natural color pink; sterile. (Reinsch's *P. Americana*?)"

P. Harveyi var. *arietina* Harv. 438, 866, 1541 = P. B.–A. 889. Flats near breakwater; Seaside park; Charles Island. Aug., Sept.

P. nigrescens (Dillw.) Grev. 317, 326, 488, 1046, 1193. Seaside Park; Cook's Point; dredged at Stratford Shoal. May, Oct.

P. nigrescens var. *affinis* (Moore) Harv. 563. Woodmont. Apr.

P. nigrescens var. *Durkeei* Harv. 853. Harbor. July.

P. nigrescens var. *fucoides* Harv. 944. Cook's Point. May.

P. Olneyi Harv. 441, 1134, 1135 = P. B.–A. 440, 1265, 1268, 1346, 1531. On rocks and shells, Fresh Pond. May, June, Aug., Sept. Tetraspores, May, June. "Dec. 12, in active vegetative condition; a large crop springing up, sterile."

P. urceolata (Lightf.) Grev. 338, 1361, 1500, 1514, 1552. Seaside Park; Charles Island. Apr.–June. Tetraspores, June.

P. urceolata var. *formosa* (Suhr) Ag. 242, 296, 300, 307, 562. Seaside Park; Woodmont. Jan., Apr.

P. variegata (Ag.) Zan. 70, 367, 373, 377, 386, 389, 394, 397, 413, 424, 467, 478, 492, 635, 655, 955, 1381, 1473, 1474 = P. B.–A. 639, 1477, 1528. Seaside Park; Cook's Point. July–Oct. Tetraspores, July.

P. violacea (Roth) Grev. 920. Seaside Park. Mar.

Bostrychia rivularis Harv. 169, 171, 172, 174, 180, 505, 545, 684. Cook's Point. Jan., Aug., Oct., Nov. "Up near high water mark where the stalks of *Salicornia* and a finish kind of grass stand thick together, mostly in the shade of *Spartina*, so that when left by the retreating tide these beds probably never become dry; there the bases of these plants and sometimes the bottoms of the sheaths of *Spartina*, and occasionally a little bit of *Fucus* are covered with a fine web of *Bostrychia*, among which are scattered fronds of *Delesseria Leprieurii*."

Rhodomela subfusca forma *gracilior* (Harv.) J. Ag. 561. Woodmont. Apr.

Dasya elegans (Mart.) Ag. 53, 66, 229, 361, 365, 376, 385, 388, 392, 393, 396, 401, 405, 415, 428, 466, 491, 506, 634, 654, 683, 760, 860, 961, 964, 970, 1205, 1327, 1336, 1337, 1387, 1389, 1391, 1393, 1395 = P. B.–A. 545, 1397, 1398, 1400, 1404, 1415, 1418, 1476. Penfield Reef; Seaside Park; Cook's Point; Long Beach; The Gut; Pleasure Beach. July–Dec. Cystocarps, tetraspores and antheridia, July.

Griffithsia Bornetiana Farlow. 399, 443, 1542. Floating, Seaside Park; Stratford Point; Charles Island. Aug., Sept., Oct. "Charles Island, small tufts floated ashore, globose antheridia-bearing cells few; vegetative tapering branches and antheridial branches on the same frond; rhizoidal processes very abundant."

Callithamnion Baileyi Harv. 238, 244, 251, 391, 538, 560, 589, 613, 1044, 1202, 1221, 1223, 1406. Floating, Seaside Park; Woodmont; Charles Island; Long Beach; covering *Chondrus* and other algae, Penfield Reef; dredged at Stratford Shoal. Jan., May–Aug., Oct.–Dec.

C. byssoideum Arn. 665. Black Rock Beacon. July.

C. corymbosum (Eng. Bot.) Ag. 690. Floating, Long Beach. Aug.

C. roseum (Roth) Harv. 1550. Floating, Charles Island. Apr. Cystocarps and tetraspores.

C. tetragonum (With.) Ag. 1551. Floating, Charles Island, Apr.

Pleonosporium Borreri (Eng. Bot.) Näg. 52, 69, 372, 390, 625, 638, 645, 665a, 876, 1031, 1140, 1402, 1405. On muddy rocks at light and spindles, and at beacon, Penfield Reef; Floating, Seaside Park; Woodmont; Long Beach; Charles Island. July–Sept. Tetraspores, Aug., Sept.

Seirospora Griffithsiana Harv. 1030. Scooped up from rocks below low water, Black Rock Beacon. Aug.

Antithamnion Americanum (Harv.) Farlow. 239, 243, 267, 301, 559, 590, 786, 1076, 1348, 1446, 1485, 1486, 1499, 1511, 1543. Floating, Seaside Park; Woodmont; Charles Island. Jan.–May.

A. cruciatum (Ag.) Näg. 469, 473, 499, 536, 614, 839, 1167. On algae and stones, Seaside Park; Long Beach; Woodmont. May–Dec.

Rhodochorton Rothii (Eng. Bot.) Näg. 189, 256, 269. On rocks, Seaside Park. Nov., Feb., March. Tetraspores, Feb., March.

Ceramium Capri-Cornu (Reinsch) Farlow. 173, 231, 1058. Washed ashore on *Zostera*, harbor. June, Oct. "Only an autumnal form of *C. strictum*, growing on *Zostera*. Of this I am convinced."

C. circinatum (Kütz.) J. Ag. 637. On *Fucus*, Woodmont. July.

C. fastigiatum Harv. 472, 1141. On *Zostera*, Long Beach. Aug., Sept.

C. rubrum (Huds.) Ag. 75, 360, 371, 1483. Seaside Park; Woodmont. July, Aug., Jan., "Luxuriant but sterile, on *Fucus*."

C. rubrum var. *secundatum* (Lyng.) Harv. 1523. The Gut. July.

C. botryocarpum Griff. (*C. rubrum* var. *proliferum* J. Ag.) 1138, 1475, 1522 = P. B.–A. 894, 1524, 1525, 1526, 1527. The Gut. July, Aug. Cystocarps and tetraspores, July. "Tetrasporic plants much less proliferous than the cystocarpic."

C. strictum (Kütz.) Harv. 63, 71, 353, 358, 359, 363, 368, 369, 374, 378, 411, 432, 437, 495, 858, 1139. Yellow Mill Bridge; on sand-covered rocks, Seaside Park; on *Zostera*, Cook's Point; Norwalk shore. June–Aug. Tetraspores, July. "432 passing into the form of *C. Capri-Cornu*; curved branchlets just starting out."

C. tenuissimum (Lyng.) J. Ag. 468, 471. On *Agardhiella*, Seaside Park. Sept.

C. tenuissimum var. *arachnoideum* (J. Ag.) Farlow. 154, 677, 1137. Always on *Zostera*; Milford Point; Woodmont; Long Beach. Aug., Sept.

Spyridia filamentosa (Wulf.) Harv. 762, 1422. Woodmont. Aug., Sept.

Gloiosiphonia capillaris (Huds.) Carm. 25. Floating, Long Beach. June.

Melobesia Lejolisii Rosanoff. 1147. On *Zostera*, Pleasure Beach. Sept.

Lithothamnion laevigatum Foslie. 615. On schistose rock, near low water mark, Woodmont. June.

Corallina officinalis L. 477. Woodmont. Oct.

Hildenbrantia Prototypus Nardo. 179. Seaside Park. Nov.

Connecticut Fresh Water Algae.

Chroococcus cohaerens (Bréb.) Näg. 776. Among other algae, on abutment of Factory Pond dam. Dec.

Coelosphaerium Kützingianum Näg. 1052. With other algae, on moist rocks, Sage's Ravine, below first falls, Twin Lakes, Salisbury. Oct.

Haematococcus pluvialis (Grev.) Flotow. 621, 629, 705. On dripping stonework, Factory Pond dam. July, Sept.

Gloeocapsa violacea (Corda) Rab. 1435 = P. B.–A. 551. Gaylordsville. Oct. "On vertical face of moist limestone, east side of road and a few rods from it, a mile or so from the station on the road to Bull's Bridge."

Arthrospira Gomontiana Setchell. 43, 345, 1126 = P. B.–A. 155, 1130. Pool below Factory Pond. June, July.

Oscillatoria amphibia Ag. 954. With *O. tenuis*, on muddy bottom of Bruce's Brook. July.

O. limosa Ag. 31, 50, 597, 747, 932 = P. B.–A. 253b. Stream in Stratford; Great Falls of the Housatonic; ditch below Factory Pond, floating and attached to plants; Berkshire Mill Pond. "1481, forming a dark purple stratum on plants in running water, Pequonnock River, below Factory Pond dam. Dec."

O. princeps Vauch. 161, 658 = P. B.–A. 2b, 850, 1413. West Branch of Bruce's Brook; Parrott's Pond; Fresh Pond, in company with *Lyngbya aestuarii*. July, Sept., Oct.

O. splendida Grev. 144, 775, 1063, 1149. Bed of Pequonnock River, in a still pool with decaying vegetable matter. Aug., Sept., Nov.

O. tenuis Ag. 143, 158, 164, 162, 584, 891, 954, 959, 1229. Floating, pool below Factory Pond; Housatonic River, on wall of quartz mill; Fresh Pond; Bruce's Brook. May–Oct.

O. tenuis var. *natans* (Kütz). Gomont. 1163, 1482. Bruce's Brook. Oct., Dec.

Phormidium Corium (Ag.) Gomont. 743, 924, 934 = P. B.–A. 304. On stonework of dam at R. R. crossing, Bruce's Brook; on dam at Moody's Pond; Island Brook, below Housatonic R. R., on woodwork of dam. Apr., May, Oct.

P. favosum (Bory) Gomont. 51. Stratum adhering to rocks in shoal running water, Great Falls of the Housatonic, below Lovers' Leap. July.

P. Retzii (Ag.) Gomont. 710 = P. B.–A. 3c, 716, 946, 958, 1414. Stream below Paper Mill, Pequonnock River; Rooster River. June, July, Sept.

P. uncinatum (Ag.) Gomont. 660, 947, 1420. "Forming a purplish or copperish skin on stones in stream below dam at Moody's Pond"; Mill River. June, July, Sept.

Lyngbya ochracea (Kütz.) Thuret. 1062, 1333. Stream below paper mill, Factory Pond; outlet of Parrott's Pond. Oct., Nov.

Plectonema Wollei Farlow. 166. On stones in swift running water, Housatonic River, below Great Falls. Oct.

Schizothrix lardacea (Cesati) Gomont. 1227. On vertical surface of dripping rock, East Rock, New Haven. Nov.

S. coriacea (Kütz.) Gomont. 1429, 1431, 1437, 1453. On limestone, bank of Housatonic River, Gaylordsville. Apr., Oct.

Anabaena oscillarioides Bory. 718. With other *Cyanophyceae*, pool below Factory Pond. Sept.

Cylindrospermum majus Kütz. 445. Forming saccate investments of grass, *Utricularia*, etc., pool below Factory Pond. Sept.

Nostoc commune Vauch. 1436. On limestone, road near Gaylordsville. Oct.

N. microscopicum Carm. 1053. Sage's Ravine, Salisbury, below first falls. Oct.

N. parmelioides Kütz. 1160. On stones in brook, Mt. Carmel. Sept.

N. pruniforme Ag. 1145 = P. B.–A. 657. Twin Lakes, Salisbury. Aug. "In stagnant arm of lower lake cut off by R. R. near station. Mostly resting on bottom, attached when young to sticks, stones, etc., growing up to a diameter of about 2 inches."

Scytonema crispum (Ag.) Bornet. 192, 1158, 1225. On rock below Factory Pond; ditch at North Haven. Sept., Nov. "Oct. 2, 1898, *Scytonema crispum* has disappeared from the old station in North Haven."

S. Hofmanni Ag. 740. On old stump, shore of upper Twin Lake, Salisbury. Oct.

S. Myochrous (Dillw.) Ag. 697, 739, 1048. "On rocks in upper Twin Lake, near shore, submerged, but alive to some extent above submerged portion." Oct.

S. figuratum Ag. 1427, 1428, 1438, 1454, 1517 = P. B.–A. 857. Banks of the Housatonic, near Gaylordsville, in tufts or sheets on limestone. June, Oct.

S. ocellatum (Dillw.) Thuret. 698. Sage's Ravine, Salisbury, on dripping rocks. Aug.

Nostochopsis lobatus Wood. 1159. On stones in brook at Mt. Carmel. Sept.

Tolypothrix lanata (Desv.) Wartmann. 182, 191, 216, 500, 706, 1153. On *Fontinalis* in Pequonnock River, below Factory Pond dam; Lake Saltonstall, near New Haven. Sept.–Dec.

Stigonema mamillosum Ag. 354, 628. On damp rocks in Mill River, near Samp Mortar Rock; on stones in Pequonnock River. July.

S. minutum (Ag.) Hass. 1050. On submerged rocks in Plantain Pond, Salisbury. Oct.

S. panniforme (Ag.) Born. & Flah. 1052. On moist rocks, Sage's Ravine, below first falls, Salisbury. Oct.

Amphithrix janthina (Mont.) Born. & Flah. 1434. Coating stones in Island Brook, below R. R. Oct.

Calothrix Braunii Born. & Flah. 503, 885, 903, 1061. Forming a coating on stones, side stream of Pequonnock River, below Factory Pond dam. Oct.

C. fusca (Kütz.) Born. & Flah. 544. On *Batrachospermum vagum*, pool below Factory Pond dam. Oct.

C. parietina (Näg.) Thuret. 733, 734 = P. B.–A. 11, 742, 1228, 1347. On stone dam of Factory Pond; on dripping rock by R. R.

between Canaan and Twin Lakes, Salisbury; on dripping rock, East Rock, New Haven; on sandy ground, shore of Fresh Pond. Oct.–Dec.

Dichothrix gypsophila (Kütz.) Born. & Flah. 1425, 1439. Gaylordsville, rapids of Housatonic River, near Kent, on limestone, river shore; narrow form, incrusted. Oct.

D. Hosfordii (Wolle) Born. & Flah. 501, 508, 514, 957 = P. B.–A. 215b, 1197. On stones on border of pool below Factory Pond, Pequonnock River. June, July, Oct., Nov.

D. Orsiniana (Kütz.) Born. & Flah. 1124, 1131 = P. B.–A. 405. On stone work at base of Factory Pond dam. July.

Gloiotrichia Pisum (Ag.) Thuret. 736, 737. Twin Lakes, Salisbury, floating and on pond weeds. Oct.

Spirogyra bellis (Hass.) Cleve. 882. Pequonnock River, Turnbull. Oct.

S. nitida (Dillw.) Link. 619, 620, 630 = P. B.–A. 513, 643. Island Brook, below dam at R. R. "July 19, Last of the season."

S. varians (Hass.) Kütz. 582. Roadside near Brookfield. May.

S. sp.? 595, 600, 607, 632, 652. Fresh Pond. May–July. 595. "Grows in abundance, floating in thick patches, along with *Cladophora*, *Enteromorpha*, etc. Dissepiments not replicate; diameter of cells uniformly about 37μ; length of cells 8–22 times the diameter; 1 or 2 spirals, making 2 or 3 to 10 or more turns; rarely 3 spirals." 607, "Spores seem to be forming in some cells without conjugation, after the manner described by DeBary (Die Conjugaten, p. 7, Pl. I. fig. 4). Sometimes 2 spores (?) in one cell; sporiferous (?) cells somewhat swollen, spores (those apparently nearest maturity) light buff colored, elliptical." 632, "In side pool from which I formerly took best specimens of *Monostroma latissimum*. Cells generally about 27 or 28μ in diameter, length generally 3–6 diameters, spirals 2 or rarely 3 turns, about 3 in a cell of full length. Dissepiments not replicate. Zygospores ellipsoidal, 56–87μ long by 31–37μ wide. Female cell swollen just enough to contain zygospore. With *Oscillatoria* which appears to be *O. princeps*. ?Whether this is not the same as 595. Water in this pool (which is now cut off from the main body by a sand bar) may be a little less salt; ?Whether this is the reason of its fruiting."[1]

Zygnema pectinatum var. *anomalum* (Hass.) Kirchn. 605. Pequonnock River, below Factory Pond dam. June.

Mougeotia robusta (DeBary) Wittr. 601, 606. Pequonnock River, below Factory Pond dam. June.

M. genuflexa (Dillw.) Ag. 668 = P. B.–A. 312, 952. Peck's Mill, Putney. July, Aug.

Tetraspora bullosa (Roth) Ag. 194, 222. Side stream of Pequonnock River, below Factory Pond dam, on stones, sticks, etc. Nov., Dec.

T. bullosa forma *cylindrica* (Hilse) Rab. 520, 521, 525. On plants and stones in Parrott's Pond. Nov.

T. lubrica var. *lacunosa* (Duby) Chauv. 195, 199, 208. Side stream of Pequonnock River, below Factory Pond dam; Stillman's Brook. March, Nov. 199, "Narrow, string-like fronds up to the length of 2 feet or more."

Gloeocystis rupestris (Lyng.) Rab. 746. With *Calothrix fusca*, etc., on stone work of Factory Pond dam. Oct.

Conferva bombycina forma *minor* Wille. 572, 717 = P. B.–A. 621, 827. Stream running into Bruce's brook, near horse-car stable; stream below paper mill, No. Bridgeport, with *Microspora stagnorum*. Apr., May, Sept.

Microspora abbreviata (Rab.) Lagerh. 925. Bruce's Brook. Apr.

M. amoena (Kütz.) Rab. 531, 928a = P. B.–A. 616. Bruce's Brook; stream below paper mill; Dec., Apr.

M. crassior (Hansg.) Hazen. 928a. Stream below paper mill, with *M. amoena*. Apr.

M. stagnorum (Kütz.) Lagerh. 602, 604 = P. B.–A. 618, 717. "Streamlet leaking through bank below the dam, Pequonnock River; some of it 2 ft. or more long; with *Conferva bombycina*."

Stichococcus flaccidus (Kütz.) Gay. 431. On bark of Horse Chestnut tree, Pembroke St., Bridgeport. Aug.

Ulothrix zonata (Web. & Mohr) Kütz. 945 = P. B.–A. 19a. On stones, Mill River, near Samp Mortar Rock. June.

Stigeoclonium tenue? 603. Stream from paper mill, Factory Pond. June.

S. lubricum (Dillw.) Kütz. 811 = P. B.–A. 660. Little pond east of Yellow Mill Pond, near Stratford Cove. May.

S. fasciculare Kütz. 828 = P. B.–A. 67. Bruce's Brook. May.

S. flagelliferum Kütz. 1170, 1171 = P. B.–A. 408. On stones in swift water, Pequonnock River, in the new channel, below Factory Pond dam. Dec.

Draparnaldia glomerata (Vauch.) Ag. 203, 236, 246, 528, 549, 554, 1070. Side stream of Pequonnock River, below Factory Pond dam; Ash Creek. Nov.–Feb.

D. plumosa (Vauch.) Ag. 550, 551, 552. Stream below paper mill, at Factory Pond. Jan. Feb.

Chaetophora incrassata (Huds.) Hazen. 145, 184, 193, 200, 205, 211, 217, 223, 237, 409, 446, 527, 553, 1204. On stones, pool and side stream of Pequonnock River, below Factory Pond dam. Jan., Feb., July–Dec.

C. incrassata forma **draparnaldioides** (Wittr. & Nordst.) nov. comb. 286. *C. Cornu Damae* (Roth) Ag. *β draparnaldioides* Nordst. & Wittr. Stream in swamp, west of Stillman's Brook. March.

C. pisiformis (Roth) Ag. 408, 447, 661. On grass and stones, side stream of Pequonnock River, etc.; on stones in mill race below Moody's Pond. July–Sept.

Aphanochaete vermiculoides Wolle. 557a. On *Hyalotheca dissiliens*, Stratford. March.

Bulbochaete intermedia DeBary, 686 = P. B.–A. 973. On grass, etc., pool by Rooster River, near Spooner's farm. Aug.

Oedogonium crenulato-costatum Wittr. 836. In little pond east of Yellow Mill Pond, near Stratford Avenue. July.

Trentepohlia aurea (L.) Mart. 1055, 1424. Rocks by roadside near Hammerton; limestone rocks on river shore, Housatonic River, near Gaylordsville. Oct.

T. Iolithus (L.) Wittr. 1452. On northerly side of rocks, with lichens, Gaylordsville. Apr.

Rhizoclonium hieroglyphicum var. *macromeres* Nordst. 1162. Fitch's Pond, Cheshire. Sept.

R. lacustre forma *Americanum* Wille. 656, 657 = P. B.–A. 624. Attached to stones, Pequonnock River, below Factory Pond dam, growing to a length of 2 or 3 feet. July.

Cladophora callicoma Kütz. 347. Great Falls of the Housatonic, Still River station, Lanesville, on stones in rapids, below Lovers' Leap. June.

C. glomerata (L.) Kütz. 349. Still River station, Lanesville, on stones in swift water, just below the dam at silex mill. June.

Vaucheria aversa Hass. 670 = P. B.–A. 475. Mill River, near Samp Mortar Rock. Aug.

V. geminata (Vauch.) DC., type and var. *racemosa* (Vauch.) Walz. 567, 570, 571. Ash Creek, below mill at Moody's Pond. Apr.

Vaucheria sessilis (Vauch.) DC. 581. Brookfield. May.

Batrachospermum anatinum Sirdt.? "A single frond among Bats collected in Bruce's Brook, north of R. R., Apr. 20. Beautiful bluish green."

B. Boryanum Sirdt. 3, 7, 10, 16, 187, 196, 202, 206, 210, 212, 219, 228, 248, 252, 275, 283, 556. Mouth of little stream emptying into the east side of Berkshire Mill Pond; side stream of Pequonnock River, below Factory Pond dam. Feb., May, Nov., Dec.

B. Corbula Sirdt. 11 = P. B.–A. 184. In a little stream running through swamp near old quarry, northwest of poorhouse, May 11. "May 30, collected in same spot as May 11. Hunted the stream a long way. Could find none except in one spot within the space of a yard." 259, 292. On sticks in still water, upper part of pool below Factory Pond dam. Mar.–May.

B. ectocarpum Sirdt. 5, 289 = P. B.–A. 183. In side stream of Pequonnock River, below Factory Pond dam; Island Brook, near mouth. Jan.–March.

B. moniliforme var. *typicum* Sirdt. 22 = P. B.–A. 180. Island Pond Brook. May.

B. moniliforme var. *chlorosum* Sirdt. 2, 165, 186, 188, 197, 198, 201, 207, 209, 213, 215, 220, 226, 249. Side stream of Pequonnock River, below Factory Pond dam. Oct., Jan. "Oct. 5, the first Bat I have found here this season; could see none a week ago."

B. pyramidale Sirdt. 933 = P. B.–A. 186. On old sticks in still water, pool below Factory Pond dam. May.

B. vagum Ag. 8, 204, 214, 218, 224, 235, 247, 526, 631, 835, 884, 902, 1166. Outlet of little pond near paper mill, below Factory Pond dam. Oct.–Feb., Apr., June, July.

B. virgatum Sirdt. 15, 253, 270, 276. 284, 291, 825, 1165. Small stream running under R. R., a little way east of Stratford depot; Island Brook; Ash Creek, below saw mill; Pequonnock River, below Factory Pond dam. Nov., Feb.–May.

Lemanea fucina var. *rigida* (Sirdt.) Atk. 45, 350. Island Brook; Great Falls of the Housatonic, on rocks in the natural dam at the crest. June.

Tuomeya fluviatilis Harv. 24, 41, 44, 64, 516, 576, 883, 956, 1164, 1232. Pequonnock River; Island Brook; Mill River, near Samp Mortar Rock. May–July, Oct.–Dec. "Nov. 15, in great abundance in Pequonnock River, near old mill just above Trumbull line, at falls."

Newfoundland, July 13–30, 1897.

St. John's, July 13–16.

1273. *Nostoc muscorum* Ag. Signal Hill.

1274 = P. B.–A. 414. *Pylaiella littoralis* (L.) Kjellman. In pools and on rocks between tide marks, shore outside of entrance to the harbor; both forms of sporangia on the same individual.

1275 = P. B.–A. 982, 1276. *Cladophora Hystrix* Stromf. On rocks between tide marks, outside shore.

1277. *Fucus* sp.? "On rocks between tide marks, or at least where wet by spray."

1278. *Dictyosiphon hippuroides* (Lyng.) Aresch. Young plants in rock pools.

1279, 1281. *Rhodomela* sp? In rock pools in narrows, outside the harbor.

1280. *Polysiphonia urceolata* (Lightf.) Grev. On rocks in harbor near narrows.

1283. *Codiolum longipes* Foslie. Coating rocks within the narrows.

1284. *Phyllitis zosterifolia* Reinke. Coating rocks on ocean shore, between tide marks, outside the harbor.

1285. *Monostroma Groenlandicum* J. Ag. On rocks, ocean shore, north of entrance to harbor.

1286. *Halosaccion ramentaceum* (L.) J. Ag. On rocks in harbor near narrows.

1287. *Alaria esculenta* Grev? On rocks below the cliff, ocean shore, north of narrows.

1288. *Chorda tomentosa* Lyng. North side of harbor, near the narrows, attached to stones.

1289 = P. B.–A. 480. *Elachista lubrica* Rupr. On *Halosaccion*, 1286.

1290 = P. B.–A. 406. *Monostroma undulatum* var. *Farlowii* Rosenv. On rocks and on other algae, between tide marks in the narrows, south side.

1291. *Enteromorpha minima* Näg. On rocks between tide marks near narrows, north side.

1292. *Dictyosiphon foeniculaceus* (Huds.) Grev. Mostly epiphytic on *Chordaria flagelliformis*, near narrows.

1293. *Porphyra miniata* Ag. Very abundant.

Topsail, on Conception Bay, July 17.

1294. *Cladophora lanosa* var. *uncialis* (Harv.) Thuret. On rocks at low water.

1295. *Ectocarpus confervoides* (Roth) LeJolis. On algae.

1296. *Phyllitis fascia* (Fl. Dan.) Kütz. Rocks near low water mark.

1297. *Lithothamnion glaciale* Kjellm. Lying free near low water mark and below.

Windsor Lake, July 19.

1298. *Stigonema mamillosum* Ag. On rocks in shoal water.

Harbor Grace, July 21.

1299. *Cladophora* sp?

1300. *Corallina officinalis* L.

1301. *Ralfsia deusta* Aresch.

1302. *Rhodymenia palmata* (L.) Grev.

1303. *Ptilota pectinata* (Gunner) Kjellman.

1308. *Hormiscia penicilliformis* (Roth) Fries. On rocks between tides.

1309. *Elachista* sp? On *Fucus*.

Quidi Vidi, July 26.

1310. *Porphyra laciniata* (Lightf.) Ag. On rocks between tides.

1311. *Calothrix scopulorum* (Web. & Mohr) Ag. On rocks between tides.

1312 = P. B.-A. 337. *Porphyra miniata* Ag. On rocks at and below low water.

Petty Harbor, July 28.

1313. = P. B.-A. *Dictyosiphon hippuroides* (Lyng.) Aresch.

1314. *Chordaria flagelliformis* (Fl. Dan.) Ag. With 1313.

1315. *Hormiscia penicilliformis* (Roth) Fries. Rocks below tide marks.

St. John's, July 29.

1316. *Codiolum longipes* Foslie. Rocks in narrows.

Torbay, July 30.

1318. *Porphyra linearis* Grev. "Up to 2 feet in length and from $\frac{1}{8}$ to 1 inch or a little more in width. Strong tendency to shut up on the median line. Fronds entire, attached to rocks by small stipe at the base. Between tide marks where surf beats upon precipitous rocks."

1319. *Phormidium Retzii* (Ag.) Gomont. On moss in stream, swift water, running into Torbay harbor.

Senecio Balsamitae, Muhl., var. **firmifolius**, Greenman, n. var. Stems 0.8 to 2 dm. high, more or less tufted: lower leaves mostly short-petioled, elliptic-oblong to subrotund, 0.5 to 4 cm. long, 5 to 20 mm. broad, crenate-dentate to sublyrately pinnatifid, thick and firm in texture, at first, as well as the stem, white tomentulose, but soon glabrate; upper stem-leaves much reduced and often prolonged into a linear entire attenuation: involucre and technical characters of the head like the species. — In red limestone detritus, crest of Les Murailles, Percé, Gaspé County, Quebec, 17 August 1904, *J. F. Collins, M. L. Fernald & A. S. Pease* (type, hb. Gray); also in limestone detritus, Mont Rouge, Percé, 23 July 1905, *J. F. Collins & M. L. Fernald* (hb. Gray). Specimens secured by Messrs. Collins and Fernald at Cap Barré, Percé, 23 July 1905, are distinctly intermediate between the variety and typical examples of the species. The variety is distinguished chiefly by the short relatively broad leaves and their thick firm texture. — J. M. Greenman, Field Columbian Museum, Chicago.

A Pale Form of Avena striata.— *Avena striata* Michx. has the empty glumes and often the flowering glumes strongly tinged with purple — so much so as to have received from Torrey the name *Trisetum purpurascens*. On some of the mountains of Maine and eastern Quebec, however, the prevailing form of the plant quite lacks this purple coloring which is so characteristic of the species, and has instead whitish or pale straw-colored empty glumes and pale flowering glumes. The plant seems to have no other distinguishing character, but in the regions where it occurs it is so constant and characteristic as to merit the distinctive name: —

Avena striata Michx., forma **albicans**, f. nov. Glumis externis albicantibus vel flavescentibus haud purpurascentibus, glumis fertilibus flavescentibus vel fulvis.— Quebec, abundant on mossy tableland, altitude 900–1050 meters, Mt. Albert, August 9, 1905 (*Collins & Fernald*, no. 26); limestone-conglomerate cliffs, Bic, July 16, 1904 (*Collins & Fernald*): Maine, slides, west wall, North Basin, and Saddle Brook, Mt. Katahdin, July 13, 1900 (*Williams & Fernald*). — M. L. Fernald, Gray Herbarium.

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